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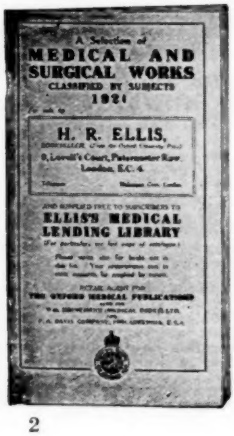

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THE Harveian orator is enjoined to commemorate past benefactors by name. Linacre, Caius, Hamey, Lord Lumley, the Marquis of Dorchester, de Mayerne, Croone, Goulston, Selden, and not least Harvey himself have by their gifts conferred enduring benefits on the College. This year it is the duty of the orator to enrol amongst the list of benefactors an obstetric physician, the late Dr. Lloyd Roberts of Manchester, who bequeathed a sum of £3,500 to the College and 1,800 medical books, including 50 "incunabula" and an almost complete set of the editions of "The Byrth of Mankynde," the first book on midwifery to be translated into English, which makes our College collection of this rare work the finest known. In bequeathing these gifts Dr. Lloyd Roberts has set an excellent example to other obstetric physicians, and I am but carrying out the injunction of Harvey in exhorting them to follow that example so that our College, whose immortal Fellow wrote the first original English work on midwifery, shall have in its library the best collection of books dealing with the functions and diseases of women. Our distinguished Fellow Sir Thomas Browne alluded to the value of the College Library; but warned his correspondent against relying too much upon books—"ridiculous are they who think out of books to become physicians." He, however, specially recommends the works of the Paduan teachers—Vesalius, Spigelius, Bartholinus, Falloppius, and Fabricius, "and be sure you make yourself master of Dr. Harvey's piece, 'De Circul. Sang.,' which discovery I prefer to that of Columbus." The other great work of Harvey was the "De Generatione Animalium," containing the chapter "De Partu." It was the activity of anatomists in research on the female generative organs which aroused Harvey's interest in obstetrics and gynæcology, and in the year 1600 he went to study at the school of Padua, the city which had at that time the most distinguished University in Europe. Thither flocked eager students, especially of medicine, to learn from the most celebrated teachers in the world.

Padua had enjoyed profound peace since the siege of Maximilian in 1509; it was a healthy town, indeed a health resort, as it had been in the days of the Romans, when the aquæ Patavinæ were celebrated; it was also a very cheap place to live in, as testified by Montaigne in 1580 and Evelyn in 1646.

From contemporary prints we can see what the University building—the "Gymnasium omnium Disciplinarum"—was like. The handsome façade of this Renaissance building was repaired during Harvey's student days, as we learn from a memorial tablet dated 1601. Over the gateway was the stemma of a Doge of Venice, and beneath it the Lion of St. Mark. Both these have since been taken down and replaced, to the detriment of the appearance of the building, by the Royal Arms of Italy. There still remains, however, the legend "Sic ingredere ut te ipso quotidie doctior evadas," an injunction which Harvey faithfully obeyed. (Fig. 1.) Passing through the gateway we come to the courtyard with its celebrated cloisters; in those cloisters were painted the "stemmata" of distinguished students, amongst them that of Gulielmus Harveius, a copy of which hangs in the College Library.

Aubrey has given us the following portrait of Harvey in his younger days. He was "of the lowest stature, round faced, olivaster (like wainscott) complexion; little eie, round, very black, full of spirit: his hair was black as a raven, but quite white 20 years before he dyed." "He was always very contemplative," writes Aubrey, "and said he did delight to be in the dark as he could then best contemplate." He was indeed one of those of whom Cicero speaks quibus vivere est cogitare, and one can picture him deep in study in the cool and shadowy cloisters of the University, even as later he had caves made in the earth near his house at Combe in Surrey in which in summer time he delighted to meditate.

The Paduan teachers Vesalius, Realdus Columbus, Hercules Saxonia, Casserius, Spigelius, and Falloppius all wrote works on obstetrics and gynæcology.

Fabricius ab Acquapendente (1537–1619), who succeeded Falloppius at Padua, was Harvey's special teacher and "guide." He made many researches in comparative embryology. He was of the opinion that the maternal vessels communicated with the fœtal, and that the fœtal heart had no influence on the circulation of the fœtus, no "munus publicum," but beat only to preserve its own life. He wrote "Opera Anatomica quae Continent de Formato Fœtu, de Formatione ovi et Pulli, de Brutorum Loquela," which appeared at Padua in 1604.[1] He figured the decidua and the cord around the neck of the fœtus and studied the placenta in various animals. Eloy says of him, "The degree of doctor of medicine with which he was honoured did not prevent him from publicly performing surgical operations." He taught for about 50 years at the school of Padua, and died there universally regretted at the age of 82. He refused fees and put the presents his patients sent him into a cabinet labelled "lucri neglecti lucrum." He built an anatomical theatre at Padua at his own expense, which generous act prompted the signory of Venice to build a much more spacious amphitheatre in his honour.

Amongst other distinguished men of the Paduan school must be mentioned Mercurialis and Mercurius. Mercurialis (1530–1606) was born at Forli in the Romagna in 1530, about ten years before Mercurius (Scipione Mercurio) with whom he is sometimes confounded. He taught at Padua for 18 years, was created a Knight of St. Mark, and amassed a fortune of 120,000 golden crowns. His most celebrated work is "De Arte Gymnastica" (1569), but many works, including "De Hominis Generatione" (1597) and "Monstrorum Historia Posthuma" (1642), were published by his pupils. He wrote an important work "De Morbis Muliebribus," which was published in the collection of all the ancient and modern works on obstetrics and gynæcology entitled "Gynæcia," the third and most complete edition of which was published by Israel Spachius in 1597, three years before Harvey went to Padua. It is interesting to note that "La Comare" by Scipione Mercurio, which was published in the preceding year, is omitted from this collection.

Mercurius ("Scipione Mercurio,"[2] ? 1540–1616) was born in Rome and studied medicine at Bologna and Padua, but soon devoted himself to theological studies, and entered the Dominican monastery at Milan, where he took the name of Hieronymus. He still continued to occupy himself with the study of medicine and, finding his monastic life did not afford him sufficient opportunities for the practice of medicine, he quitted the monastery and travelled in France and Spain in the years 1571 and 1572, as physician to a German officer, Hieronymus de Ladrone. On completing this journey he returned to Italy, practised with great success in Padua, and settled in 1601 in Venice, where he lived for 15 years. He wrote "La Comare o Ricoglitrice," the first Italian work on midwifery. It contains chapters and illustrations of Cæsarean section on the living patient,

[1] Haller says it appeared in 1600.

[2] This is the usual form of the name, but in the first edition it is printed "Scipione Mercuri" on the title-page of the first book, "Scipione Mercurio" on the title-pages of the second and third books.

which operation he introduced into Italy. He relates that in his travels in France he had seen two women in Toulouse who had been delivered by Cæsarean section, one of whom had since been happily delivered nine times. To commend the operation to his countrymen he wrote that it was as well known in France as bleeding for headache in Italy.[3] This passage was erroneously rendered by Welsch, who published a German translation of "La Comare" in 1653, "so gewöhnlich in Frankreich als das Aderlassen in Italien"—"as *common* (or *usual*) in France as bloodletting in Italy"—whereas Scipione Mercurio only said it was *as well known*. This error has often been repeated by subsequent writers, and has been used to throw doubt on Mercurio's accuracy. In this work Mercurio is the first author to mention contraction of the pelvis as an indication for Cæsarean section. It contains a description and illustration of the "hanging-legs" position for delivery in cases of contracted pelvis, which Walcher published in 1889 as something new, and also a description of the operation of bimanual version, generally associated with the name of a distinguished Fellow of this College, the late Dr. Braxton Hicks. (Figs. 2 and 3.)

FIG. 1.—The façade of the University building at Padua at the beginning of the seventeenth century (from Guzzoni's "L'Italia Ostetrica," 1911).

It is interesting to find that the first Italian book on midwifery was a cinque cento production and was published by a Paduan obstetrician four years before Harvey went to that University. It can hardly have failed to arouse Harvey's interest, must have had an effect in popularising Cæsarean section on the living, and may have been the stimulus to Harvey to emulate the Paduan obstetrician by writing his "De partu," the first original English work on midwifery.

POSITION OF OBSTETRICS AT THE END OF THE SIXTEENTH CENTURY.

It was under the influence of such men as the above named that Harvey was led to write his great work on generation and labour. In order to appraise this work it is necessary to consider the position of obstetrics at the end of the sixteenth and the beginning of the seventeenth century. Italy was the first country in Europe to encourage anatomical research. At the School of Salerno in 1238 it was ordered that every five years a human corpse should be dissected before the students of medicine and surgery, and in 1442 two corpses were annually provided free of cost for dissection in the University. In Mundinus's work on Anatomy,[4] written in 1316, is the first description of the dissection of the human body since ancient times. The progress of anatomical study in Italy was favoured by the ancient Lex Regia, which enacted that no pregnant woman should be buried until the fœtus had been cut out of the womb, and by the ritual of the Roman Catholic Church which prescribed "if a pregnant woman die the fœtus shall be cautiously extracted as soon as possible and, if alive, shall be baptised"; which led to a great extension of the operation of Cæsarean section on the dead, especially during the frequent epidemics of plague,[5] and we have seen that the operation on the living woman had been introduced by Scipione Mercurio four years before Harvey began his studies.

France, in the person of Ambroise Paré, had begun to progress in midwifery even before Italy. But in England the art of obstetrics was neglected. There was no original work on midwifery in the English language, only translations of Rhodion, Guillemeau, and Paré were available. The ordinary practice of midwifery was in the hands of midwives who, although practising as specialists since the dawn of history, had failed to develop the science or advance the art or dignity of their calling. They were mostly recruited from an uneducated class and their characters were not beyond reproach. Some of them resembled Terence's midwife, Lesbia:—

> "Sane pol illa temulenta est mulier et temeraria
> Nec satis digna cui committas primo partu mulierem."

They were bitterly opposed to the doctors, who were only called in to difficult and operative cases, which were often rendered fatal by the ignorance and brutality of the midwives. The doctors, on the other hand, having little experience of normal cases, were apt to intervene too soon, especially when instruments, hooks and (later) forceps were employed. Only in France, where the modern development of midwifery began, had midwives attained any considerable position.

In 1598, the first of the great French midwives, Louise Bourgeois, obtained her diploma. Her examiners consisted of a physician, two surgeons, and two midwives. As the candidate was the wife of an army surgeon, one of the two examining midwives was of the opinion that Louise Bourgeois ought not to be admitted, her reason being that "she and the doctors would have a secret understanding like pickpockets at a fair." We see here the beginnings of the rivalry between midwives and doctors which was to lead up to that remarkable series of lampoons on the man-midwife in the eighteenth century and subsequently, echoes of which have been heard from time to time, even within the walls of this temple of good-fellowship, Harvey's College. Louise Bourgeois was the first to describe prolapse of the umbilical cord, face presentation and its treatment, and expression of the placenta. She attended in her confinements Marie de Medici, wife of Henry IV. and mother of Henrietta Maria, the wife of Charles I., to whom

[3] "Questa attione é cosi nota per quei paesi come in Italia il cavare sangue nelle doglie di testa."

[4] "De omnibus humani corporis interioribus membris anatomia," 1316. The first edition was published in 1596, and not 1604 as erroneously stated by Haller.

[5] Under Clement VI at Siena, during the plague in 1348, official necropsies were made to discover the cause of the disease. Curatulo, "L'arte di Juno Lucina in Roma," 1901.

Harvey makes many references in his work "De Generatione Animalium."

The grievous practices of many of the midwives in England are given in great detail by Harvey's friend, Percivall Willughby. He writes: "When the meanest of the people were made priests in Jeroboam's days then Israel began to be afflicted; afterwards followed the destruction with the captivity of the people. When the meanest of the women not knowing how otherwise to live for the getting of a shilling or two to sustain their necessities become ignorant midwives, then travailing women suffer tortures by their halings and stretchings of their bodies, after which followeth the ruinating of their health and sometimes death." He goes on to give a testimonial in favour of the practice in London, where "the young midwives be trained seven years first under the old midwives before they be allowed to practice for themselves." In 1616, Peter Chamberlen II. made a petition to King James that some order might be settled by the State for the instruction and civil government of midwives; but nearly 300 years were to elapse before the desirable result was obtained through the persistent efforts of the Obstetrical Society of London (Midwives Act, 1902). In England the position of midwifery was degraded and the study of anatomy was in an inactive state when Harvey [6] went to Padua,

FIG. 2.—From the first edition (1596) of Scipione Mercurio's "La Comare"; Cæsarean section; the incision is to be made to the right of the middle line so as to avoid the spleen.

where both subjects were being assiduously studied. The obstetrical and gynæcological writings of ancient and modern authors had just been published in the "Gynæcia"; the circulation of the blood, "the greatest physiological discovery of all times," was as yet unknown; the compound microscope had not been invented, and thus neither the ovum nor the spermatozoon could be seen. The ovary was still called the testis muliebris, but the ovarian follicles, although observed by Spigelius, were not well known till De Graaf published his observations in 1672; the spermatozoon was discovered by a medical student, Hamen, in 1675, as announced by Leeuwenhoek in the Philosophical Transactions in 1677. Thus when Harvey wrote the "Generation of Animals" he was dependent on naked-eye observation and experiment, and in reading this remarkable work one cannot help having a feeling of profound sympathy with the author and regret that the causa causans of generation should have escaped him solely because the compound microscope had not yet been invented, notwithstanding an amount of original research, faithful record, and close reasoning which has perhaps never been surpassed by a medical author.

HARVEY'S BELIEF IN PERSONAL EXPERIMENT.

In the preface to the "Generatio Animalium" Harvey approves the opinion of Aristotle as to the necessity for observation and personal experience, and states that—

"No man can be truly called *prudent* or *knowing* who doth not by his own experience followed by manifold remembrance, frequent sensation and diligent observation know these things to be so. For without that we think only, or believe, and such knowledge as that is to be reputed other men's rather than our own. Wherefore fond and erroneous is that method of seeking truth in use in our times; while most men diligently enquire not what the truth is, but what other men say it is; and inferring universal conclusions from particular premisses and thence shaping to themselves irrational deductions they transmit to us things like truth for truth itself. Hence it is that sophisters and half-knowing men, polling other men's inventions, saucily impose them

FIG. 3.—From the first edition (1596) of Scipione Mercurio's "La Comare," showing the "hanging-legs" position for delivery in cases of contracted pelvis.

upon us for their own (shifting only the phrase and order and adding some impertinences of their own) and render Philosophy (which ought to be clear and perspicuous) obscure, intricate and confused. For whoever they be that read authors and do not by the aid of their own Senses abstract true representation of the things themselves (comprehended in the author's expressions) they do not resent true *Ideas*, but deceitful *Idols* and *Phantasms* by which means they frame to themselves certain *shadows* and *Chimæras*, and all their theory and contemplation (which they count *Science*) represent nothing but *waking men's dreams* and *sick men's phrensies*."

In this and other passages defining his method of inquiry into the generation of animals, Harvey uses language very similar to that employed by Bacon, showing that he approved and adopted Bacon's method and did not assume a contemptuous attitude towards that great philosopher, as one might infer

[6] "Ex ea ipsa Anglia in qua hactenus anatome fere nulla fuerat exstitit novum artis lumen, cujus nomen ab ipso retro Hippocrate in medicina secundum est." Haller quoted by von Siebold, "Gesch. der Geb.," 1845, Vol. II., p. 246.

from Aubrey's statement that Harvey said, "he wrote philosophy like a Lord Chancellor, speaking in derision." Harvey gives another instance of his respect in the second part of his treatise when, after describing in great detail the development of the chicken ("all which hath perhaps been sufficiently prolix") he writes: "hereupon (to use the expression of our most learned Verulamius) we shall proceed to our *second vintage*." He had a great admiration for the ancient writers, but said that only the ignorant will grant that they had "engrossed the whole truth." The neoteriques he called by an opprobrious name which even Aubrey was ashamed to print. He had little faith in "bookwrights, who conceive it plentifull satisfaction of minde to them that they finde it in Books and have their memories well loaded with sage sentences; for they that are thus philosophers ex traduce, by descent and derivation, are just as wise as their libraries." He appealed to observation of nature and experiment. His statement, "Nature herself must be our adviser; the path she chalks must be our walk," is an indication of the course he followed in his chapter on labour.

EMBRYOLOGICAL, GYNÆCOLOGICAL, AND OBSTETRICAL WORK OF HARVEY.

It is known to you all that Harvey was engaged during many years in almost daily observation and dissection of eggs and the uterus and embryo of animals and man. The results of his patient researches added greatly to our knowledge, and justify the remark of Frederick Ruysch that Harvey, "who is to be considered amongst the greatest of true philosophers," advanced the history of generation by his personal observations more than his predecessors by their united labours.[7] One pregnant generalisation, "ex ovo omnia" or "omnia animalia ex ovo," resulting from his researches is placed in the forefront of his "De Generatione Animalium," and it is, to use a favourite expression of Harvey, "strange" that a distinguished writer[8] should have failed to find the aphorism in the work, since "ex ovo omnia" appears on the remarkable frontispiece of the Latin edition published in London (with illustrations of the "animalia"), and on the second page appears the statement "omnia animalia ex . . . ovo." The mistake was probably due to the writer's having read one of the Amsterdam editions in which the plate does not bear the legend.

Harvey was a supporter of the doctrine of epigenesis as opposed to preformation of the embryo, and although he failed to discover the true nature of the ovum and regarded the uterus itself as an "exposed ovum," yet he is to be numbered amongst the "ovists" as opposed to the "animalculists" who were misled by incorrect observation with the compound microscope while Harvey formed a correct judgment based on accurate observations with the naked eye. Harvey had only the aid of a simple lens ("perspective") to aid him in observing the minute changes occurring in the early stages of development; but the care he took is remarkable. He would place his specimens in water in a silver basin (no doubt to get reflected light) and took care to arrange for brilliant illumination of the object, as, for example, in his observation of the punctum saliens.

> "If you are desirous to make discovery of this observation towards the declining of the third day, you may, if you be extreamly intent, by the assistance of a clear and *great light*, or by the *Sun beams*, or a *Perspective*, make a shift to discerne it. For else this purple streak is so exceedingly nice and fine, and the motion of the *Punctum saliens* is so imperceptible, that you will only loose your labour."

As an admirer of careful observation in others, and as showing how remarkably the faculty of observation can be improved by practice, he gives instances of "a silly ignorant shepherd," who knew every sheep of his flock and the lambs belonging to each sheep; of hunters who can tell the state of the deer hunt in a wood from the various cries of their dogs; of others who can discover which eggs belonged to which hen. "I would," says Harvey, "we could as easily judge which son belongeth to which father."

HARVEY'S DESCRIPTIONS OF THE FŒTUS.

Harvey was the first to locate the origin of the embryo in the "cicatricula," and refuted Fabricius's opinion as to its origin in the chalazæ, the function of which as ligaments for the yolk Harvey was the first to discern. He showed by many direct observations and convincing arguments that the chalazæ had nothing to do with the embryo and casts a little ridicule on his master Fabricius's view in the words, "how improbable a thing is it that every egg should have two seeds or rudiments for the constitution of only one chicken." The bulk of Harvey's "Generation" consists in his careful observations and descriptions of the development of the ovum and fœtus in all stages in birds,[9] animals, and man. His remarkably accurate descriptions of the human fœtus make us regret that he did not employ the skill of his fellow traveller Hollar to illustrate them. He made many dissections of human embryos of almost all sizes "from the big-ness of a tadpole and so upwards to the birth." He calls attention to the great changes which take place in the second, third, and fourth months, and had often dissected the human ovum in the second month. It was of the size of a pheasant's egg; sometimes he found a fœtus, in others none. The fœtus was of the length of the nail of the little finger, but the shape was like a little frog save only that the head was great and the legs extremely short; just like the tadpoles in June. "The face was like that of other animals as of a dog or cat without lips and a wide mouth from one ear to the other." His description of the fœtus and its viscera at various ages commands our warmest admiration, both for its accuracy and happy illustration; thus of the fœtus at the third month "the substance of the heart was most white, having two ventricles of equal magnitude and thickness and a double *cone* like two twin-kernels of a nut; the liver was wondrous little and also white. All this time, namely for three months, scarce anything of the after-burden is to be seen." He points out how the head at first out-strips the body in bulk, but afterwards is very much short of it, that the like disparity is between the body and the limbs, so that at the second month his arms are so short that if you stretch out his fingers to their furthest extent they will not be able to touch one another, and his thighs are so short that being inflected upon his abdomen they will hardly reach to his navel. In new-born children the bulk of the body is a pretty deal larger than that of the limbs until they are able to stand and go. "But go upright they cannot till the prolixity of their legs and thighs exceeds the longitude of the rest of the body. And hence is it, that their first venture to foot it represents them a prone kind of cattell which can scarce exalt themselves to the erection of a cock."

Harvey made a discovery of the highest medico-legal importance when he observed that the lungs of fœtuses which had breathed "stretched and dilated by the air put on a whiter colour, and by this observation of the different complexion you may discover whether a mother brought her child alive or dead into the world; for instantly after inspiration the lungs change colour, which colour remains, though the fœtus die immediately after." The great and original merit of Harvey's work on generation lies in the careful and methodical observation and record of the embryo and fœtus at all stages. Harvey did for development what the illustrious Paduan professor, Malpighi, subsequently did for disease in his "De Sedibus et Causis Morborum" (1761).

HIS CONSIDERATION OF GENERATION.

When Harvey came to consider the causa causans of generation he confessed he was "at a stand." It

[7] "Adversaria Anatomica," Amsterdam, 1729.

[8] Dr. Arthur Farre (Harveian Oration, 1872) He gives the dictum as "omne animal ex ovo," and in a note (though not in the text) gives "omnia animalia . . . . ex ovo" as the nearest approach to the aphorism.

[9] In dissecting birds Harvey discovered the "perforation of the lungs" and the communication of the bronchi with the abdominal air-sacs.

was a "dark, obscure business" about which "authors do nowhere more cavil and contend." Having failed, owing to the non-existence of the compound microscope, to discover the ovum or the spermatozoon, and having convinced himself by many observations and experiments that no part of the male seed entered the uterus, "and yet there is a necessity that something should be there which may render the female fruitful," he had no refuge left but to apprehend that the woman was impregnated by the conception of a general immaterial idea, "that the same thing is effected in the womb as in the braine, unless," he adds, "some cunning Philosopher whom the gods have better provided for can finde out some efficient cause which is not included in our recapitulation." Atoms, contagion, effluvia, odours, incorporeal spirits had all been cited as the efficient cause: Harvey pleads for a place for his conjecture which he offers "in a problematical way" until there be some certainty established in the business. "Let the learned and ingenious stock of men consider it; let the supercilious reject it; and for the scoffing ticklish generation, let them laugh their swinge." The whole of the work on the development of the fœtus is a testimony to his great powers of observation and reasoning, and justifies Sir Thomas Browne's description of Harvey as an "ocular philosopher and singular discloser of truth," and his work as "that excellent discourse of generation so strongly erected upon the two great pillars of truth, experience and solid reason."

GYNÆCOLOGY.

Gynæcology in Harvey's time was in an embryonic state of development. Since Moschion wrote his Περι των γυναικειων Παθων it has taken its place in practice by the side of midwifery, an association which it should always retain. Harvey made several notable contributions to this branch of medicine. He gives a good description of the broad ligament of the uterus—"the pendulous band or tie" he calls it; mentions the Hottentot apron of which he received information from a surgical friend, "an honest man": this he likens to the "vail" in animals. He describes the green sickness in virgins "whose womb is slender and their terms are at a stay"; had seen ectopic gestation; alludes to the displacement of the womb; is doubtful as to the agitation of the womb in hysteria, the discovery of the truth of which "as it is very difficult so it is worthy the attempt." He gives a good account of spurious pregnancy and mentions an instance in a noble matron whom, in spite of all the arguments he could suggest, he was unable to persuade that she was mistaken; this shows a considerable experience and confidence in diagnosis.

Harvey applied his knowledge of the circulation of the blood to surgery, pointed out how by tying the artery going to a tumour the tumour could be removed with safety, and thus laid the scientific foundation for the extensive operations, such as hysterectomy, now performed by the same method (isolated ligation of vessels instead of ligation en masse) a lesson not yet learned by all gynæcologists at the present day. In the treatment of intra-uterine diseases Harvey invented a dilator, after which he used injections and by this means cured patients suffering from offensive discharges and from sterility. Harvey discovered a peculiar bleeding tumour of the uterus which he called the "honey-comb"; for the mention of which we are indebted to the "Observations in Midwifery" of his friend, Dr. Percivall Willughby. When we recall that we owe to Ent the publication of the "De Generatione Animalium" we can only surmise how many other observations of Harvey's were contained in his lost "Medicinal Observations" to which Harvey often refers. Willughby writes:—

> "There came into my house, at Darby, my honoured good friend Dr. Harvey 1642. Wee were talking of seuerall infirmities, incident to the womb. After that I had related the aforegoing story de caudâ muliens, and how shee flouded, and was cured, hee added to my knowledge an infirmity, which hee had seen in women, and hee gaue it the name of a honey-comb, which also, hee said, would cause flouding in women."

No further details are given; but the appellation "honey-comb" suggests that the growth had holes in it discharging thick fluid: so far as I know the only condition of the cervix corresponding with this description is a very rare form of cancer of the cervix, an instance of which has been published, with illustration, in the Lettsomian Lectures for 1920. Percivall Willughby was at the time of Harvey's visit 66 years of age and was well acquainted with the ordinary forms of cancer, of which he records many observations. It is interesting therefore to find that Harvey should be able to add to the knowledge of this experienced gynæcologist an undescribed disease, the "honey-comb."

MIDWIFERY.

Harvey's Chapter on Labour ("De partu"), the first original English work on midwifery, justifies Aveling's designation of Harvey as the father of British midwifery. The scientific part of the work consists in criticism of previous opinions on the anatomy and physiology of the fœtus and of parturition based on his own observations; the practical part gives evidence of extensive personal experience in midwifery and is in the main devoted to the recommendation of patient watchfulness and gentleness, imitating nature, in ordinary cases, and podalic version in difficult ones.

Harvey was the first to describe accurately the fœtal circulation and the great development of vessels in the pregnant uterus. He also had observed, as Ambroise Paré had done before him, the softening and loosening of the sacro-iliac and pubic articulations before labour. He gives a careful description of the lie and posture of the fœtus in utero, states that it executes the somersault ("dives down") a little before labour and that it sometimes changes its presentation from time to time. "For he swimmeth in a water and moveth himself to and fro, he stretcheth himself now this way, and now that, and so is variously inflected and tumbled up and down, in so much that sometimes, being entangled in his own navel-string, he is strangely ensnared"; "and the Great-bellied women know full well that he doth sometimes acquire a different scituation when they find the Child kick sometimes above, sometimes below, and now on this side and at other times on that." With regard to the duration of pregnancy, he gives the usual ten lunar months. He quotes Franciscus Valesius's case of the survival of a five-months' girl and another case of a woman who bore a living child after a gestation lasting 16 months. "But I confess," says Harvey, "these are rare accidents." "It must not be denied that there are many crafty and fraudulent women which for lucre sake, or for fear of punishment or infamy will feign and swear they are with child. And likewise it is well known that others are easily deceived and do conceive themselves to be with child when it is no such thing." And a superfœtation may cause the duration of pregnancy to be apparently longer than it is in fact. He alludes to cases in which the fœtus is born completely enclosed in the unruptured membranes, and cases of adherent placenta "oftentimes hardly divided from the uterus which doth induce evil symptoms, noisome smells, and sometimes gangreen whereby the mother is brought into imminent danger."

Harvey shared the opinion of Hippocrates that the birth of the child was due in the main to its own efforts, and here is at variance with Fabricius, who ascribed the work to the uterus, the muscles of the abdomen, and the diaphragm. Harvey admits, however, that the uterus has its share in the business, and gives details of a case of labour in a procident uterus as a proof, and states that an unnatural birth sometimes results from failure of the mother in her expulsive office (uterine inertia). Harvey gives a careful description of the involution of the uterus after delivery and of the lochial discharge. "It is indeed a wonderful thing that the so vast bulk of the uterus should so much lessen in so short a space, namely, in the space of 15 or 20 days." This is a more accurate statement of the period during which

the uterus is palpable in the abdomen after delivery than that given by most modern text-books.

He shows his extensive experience by mentioning rare cases in his own practice, such as ectopic gestation, the passage of by-waters (hydrorrhœa) without premature labour ensuing, which "he had often seen," the survival of the infant which had been delivered by Cæsarean section several hours after the death of the mother, the child sucking the finger while still in the passage (? face presentation), the successful delivery of an unconscious woman (? eclampsia) by irritation of the nares; the removal of a putrid "false conception" (? sloughing fibroid) after delivery; the vagitus uterinus, &c.

Harvey has a special chapter on the membranes and humours of the uterus. With regard to the chorion, he points out the error of Fabricius in stating that the urine of the fœtus was passed through the allantois into the chorion and that the amnion contained the sweat of the fœtus, and asks if his master had ever seen such a creature as a sweating chicken. His own opinion was that the liquor amnii served as food for the fœtus. He based it upon the opening of the mouth of the fœtus seen through the membranes, the fact that the child will suck the finger while still stuck fast in the birth, and the way in which a new-born child sucks "as if he would devour the nipple; he still draws it into his mouth and by the aid of his tongue and palate he sucks the milk as if he chewed it; with farre more earnestness and delight than a grown body. Wherefore he seems to be good at it of old and to have practised it in the womb." Harvey also showed, as Arantius had done, that there was no communication between the vessels of the fœtus and the mother; the placenta "served to concoct or digest the alible nutriment which proceedeth from the parent to support the fœtus"; perhaps Harvey here anticipated the discovery of the function of the syncytium.

In considering the practical side of Harvey's work in obstetrics we are handicapped by the unfortunate loss of his "Medicinal Observations." In the management of ordinary labour he advocates patience and gentleness in imitation of Nature, which "is a perfect operatrix"; "if you carefully ponder Nature's works you shall find none of them made in vain; but all directed to some end and some good." He especially rebukes the "younger more giddy and officious midwives who, lest they should seem unskilful at their trade, do mightily bestirre themselves and provoke the expulsive faculty by medicinal potions whereby they rather retard and pervert it and make it an unnatural and difficult delivery and vainly persuading the women to their three-legged stoole weary them out and bring them in danger of their lives. It is much happier with poor women, and those that dare not own their great bellies where the midwives help is never required, for the longer they retain and retard the Birth, the easier and more successful proves the delivery." The birth in breech presentation is slow and painful, "and yet notwithstanding in abortment, and where the fœtus is dead or that there would be a hard delivery any other way, so that there is necessity of handiwork in the business, the more convenient way of comming forth is with the feet forward; for by that means the straights of the uterus are opened as it were by a wedge."

An excellent description is given of the contraction and involution of the uterus after labour, of the lochial discharge, of the after-pains, of the condition of the os as indicative of the state of the contents, of the powerful contraction of the uterus resulting from stimulant injections and the state of the lochia as a guide to treatment. He points out that if any clotted blood or any other preternatural matter remains in the cavity of the womb after delivery, the womb will neither retire upwards nor close its orifice, but its neck will continue soft and open, and mentions a case where, guided by this experience, he successfully removed an "almost gristly substance" (apparently a sloughing fibroid) as big as a goose's egg from a puerperal patient suffering from fever, a disordered pulse and a cold sweat "as if she were a-dying."

HARVEY AND PERCIVALL WILLUGHBY.

Fortunately we are able to judge of the high esteem in which Harvey was held as an obstetric physician by the writing of his contemporary Percivall Willughby (1596–1685), who was the son of Sir Percival Willughby of Wollaton Hall, Nottinghamshire, and uncle of Francis Willughby the naturalist. He was educated at Tunbridge, Rugby, Eton, and Oxford, graduated B.A. on July 6th, 1621, and was admitted an extra Licentiate of the College of Physicians on February 20th, 1640. He practised in Derby from 1631 to 1655, when he removed to London for the better education of his children, returning in 1660 to Derby where (except for a short interval at Stafford) he practised up till his death at the advanced age of 89. He acquired a great reputation in midwifery throughout Derby and the neighbourhood, and wrote "Observations in Midwifery," and "The Country Midwife's Opusculum,"[10] which were first published in one volume in 1863, by H. Blenkinsop at Warwick, from a manuscript then in his possession, and now in the Library of the Royal Society of Medicine. Another manuscript was in the possession of Dr. Aveling. In this work, which gives the best contemporary account of midwifery in England, Willughby quotes his honoured friend Dr. Harvey on no less than 16 occasions, attributes all his knowledge to him and recommends his work in the following words, with which I will conclude: "I know none but Dr. Harvey's directions and method, the which I wish all midwives to observe and follow, and oft to read over and over again; and, in so doing, they will better observe, understand and remember the sayings and doings of that most worthy, good and learned Dr., whose memory ought to bee had for ever in great esteem with midwives and child-bearing women."

HUNGER-OSTEOMALACIA IN VIENNA, 1920.

I.—ITS RELATION TO DIET.*

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A Report to the Accessory Food Factors Committee appointed jointly by the Lister Institute and the Medical Research Council.

Introductory.

TOWARDS the end of 1918 a condition with symptoms comparable to those of the earlier stages of osteomalacia was prevalent in Vienna. X ray photographs of some of the cases showed osteoporosis, and in a few instances spontaneous fracture occurred. The disease was described by Edelmann (1919), Schlesinger (1919, I. and II.), and Schiff (1919). Schlesinger pointed out that this disease to which he gave the name "hunger-osteomalacia" differed from osteomalacia associated with pregnancy in its slower development and more chronic character. Further, the pelvis was seldom affected, marked deformity was uncommon, and the majority of patients were elderly individuals of either sex. The disease occurred chiefly among the poorest section of the population, but many cases were noted also among middle-class people in reduced circumstances. All observers expressed the opinion that it was in some way connected with the food deprivation then existing in Vienna. In the late summer of 1919 there was a marked remission in the number of cases (Schiff, loc. cit.). Our investigations began in the autumn of the year 1919, and inquiries were first made in

[10] A Dutch translation of the "Opusculum" was published in 1642 at Leyden.

* The clinical observations contained in this paper were made by Dr. Dalyell.

October and November, regarding the occurrence of the disease, but no cases were found. In December, however, fresh and recurrent cases were seen in two convents in which the nuns had suffered severely during the previous winter, and simultaneously there appeared in the hospitals, both as out-patients and in-patients, persons suffering from the disease in various degrees of severity. From this date until the late spring of 1920 there was no lack of material for study.

By arrangement with Prof. Dr. Arthur Schiff, investigations were undertaken in his out-patient department at the Central Verband der Krankassen, one of the principal medical centres of the Health Insurance Organisation in Vienna. At this centre medical examination took place of all persons applying for sick pay through inability to work. Between January, 1920, and May, 1920, over 600 patients diagnosed as cases of hunger-osteomalacia attended for medical advice; of these 204 were selected for special study. These patients attended regularly for examination and special treatment, and observations were made of their progress by Miss M. Hume in collaboration with Dr. E. Nirenstein. A detailed account of this investigation is published in a separate paper.

In addition to the ambulatory cases in convents and at the Krankenkassa, special observations were made on 18 cases admitted to the III. Medizinisches Klinik of the Allgemeines Krankenhaus by permission of Prof. Dr. H. Schlesinger, and upon eight cases in the I. Med. Klink of the University (Prof. K. F. Wenckebach), in collaboration with Dozent Dr. Porges.

Onset, Symptoms, and Course of the Disease.

The short description of hunger-osteomalacia symptoms given by Schlesinger and Edelmann has reference to severe cases admitted to hospital as in-patients. In these the painful areas were commonly the chest and the sacral region, the ribs were invariably sensitive to pressure, and less often pain was felt in the extremities. Bones of the face were affected in about one-third of the cases, the pelvis was rarely painful, and pelvic deformity was not observed. There was great pain on movement, and in cases not completely bedridden there was a characteristic stiff and waddling gait, and the climbing of stairs was specially difficult. Frequently the patients declared that they had decreased in height. Edelmann described the condition of his patients as prematurely aged.

The variety of material that was available allowed our observations on the disease to be made at all stages of its course.

The initial symptom was difficulty in walking, owing to pain in the tarsal and metatarsal bones, generally accompanied by œdema of the feet and ankles. The œdema when present subsided after some weeks, but without diminution of pain on walking. The lumbar and sacral regions were next affected, and stooping or walking was accompanied by severe pain in these areas, of an intense and persistent nature. Thoracic symptoms developed later with pain on compression of the ribs, progressing from lower to upper ribs; pain was often felt also on coughing or deep breathing. Arms, shoulders, and hands were not so often affected, and face symptoms were present only in the most severe cases.

The disease was afebrile, and progressed from the early condition with mere discomfort in walking to a bedridden state in which any movement of the body caused agonising pain. The following description applies to the ambulatory cases of moderate severity which came most commonly under observation. The patient had a characteristic expression, the face sallow, the eyes sunken and with an expression of suffering. The skin was dry, harsh, and loose, the body anæmic, flabby, and ill-nourished, but not usually emaciated. Movement was painful, and in walking the body was bent forward and, as a rule, support of a stick in one or both hands was necessary. The waddling gait and the difficulty in mounting steps were so characteristic that it was easy to detect sufferers from the disease among the people in the street, especially when endeavouring to enter trams or vehicles. The legs were widely spaced, the feet hardly lifted from the ground in short shuffling steps, and the body moved stiffly from side to side in the endeavour to limit as much as possible swinging movement at the hips. Attempts to step upwards, as in mounting stairs, failed unless a support could be grasped with the hands and the body pulled up by the shoulder muscles. The pains were always associated with movement. As long as the patient could remain motionless, whether lying, sitting, or standing, there was little discomfort; but movements in which the trunk muscles were involved, as in bending, turning, sitting up, or walking, caused acute pain which was always worse with the preliminary muscular effort.

The hands, arms, and shoulders, being seldom affected, were much used in carrying out movements. Thus the patient would change from lying to sitting, or from sitting to standing, with the help of arms and hands; and in a severe case would get in or out of bed only after flexing the legs by lifting the thighs with the hands over the edge of the bed. The defective action of the body muscles was not due to loss of power, but to voluntary limitation of movement owing to apprehension of pain. Many movements only became painful when pressure or weight was exerted on the parts concerned. For example, if the patient could support the body by grasping a fixed object with the hands, the foot could be lifted from the floor and the leg flexed at the hip and knee without obvious discomfort, but a similar movement to carry the body up a step was often impossible, from the severe pain produced by throwing the weight of the body on one side of the pelvis.

Systematic examination of patients showed certain areas where manual pressure was almost invariably painful. Such pressure points were always over bones. The joints were rarely involved and muscular masses were never sensitive. The tarsal bones, especially the head of the astragalus and the proximal ends of the metatarsals, were usually sensitive, also the lower ends of the tibia and fibula, and the anterior and inner borders of the tibia in its lower half; the lower two-thirds of the shaft of the femur was occasionally sensitive. The knee-joint was rarely involved, and the hip-joint was always free from pain. The most sensitive pressure area was the sacral and lumbar region—e.g., over the sacro-iliac joints and transverse processes of the lumbar vertebræ. Severe pain was always felt in this area during stooping or bending movements, and this symptom was always marked and persistent. The iliac crests, pubic rami, and pubic symphysis were seldom affected, and deep pressure through the abdominal wall on the inner surface of the ilium was never painful. Bony deformity of the pelvis did not occur in any case seen by us.

Sudden abduction of the flexed thighs usually caused severe pain over the lesser trochanter and at the site of the insertion of the adductor muscles, a symptom attributed to sudden tension of the ilio-psoas and adductor muscles. This formed one of the chief diagnostic features of the disease and was an important indication of its progress or remission.

In almost every case, sudden compression of the ribs caused acute pain, felt most severely in the axillary line. The lower four ribs were commonly affected; in severer cases the fourth–eighth ribs also, and the upper ribs were rarely involved. Here also the pain was evidently associated with tension of the intercostal muscles. The thoracic vertebræ and posterior rib junctions were not sensitive nor were the costochrondal junctions and costal cartilages. Pressure on the sternum sometimes caused pain but it was not often severe. The bones of the face were sensitive only in certain advanced cases and this symptom yielded readily to treatment. When present the painful pressure points were over the supra-orbital ridges, malar bones, nasal bones, and along the mandible.

The muscles were not painful when handled, showed neither wasting nor other deformity, and their contractile force was not diminished. It was therefore unlikely that the whole muscle was involved in the existing lesion. The nerve reflexes were normal, and there was no evidence of peripheral neuritis nor of damage to nerve trunks, so that it was improbable that the symptoms of the disease could be due to nerve involvement only. The association of tetany with the disease was not infrequent. This is a point of special interest and is dealt with in a later section.

The degree to which bones were involved in the lesion was difficult to determine. The sensitive areas were limited. Bony deformity was not seen by us, but has been described by Eisler (1919), Eisler and Hass (1921), and Schlesinger. In their observations the affected areas included ribs, pelvis, spinal column, and femur. Evidence of a pathological change in the substance of the bones was obtained by us from a few patients who gave definite history of decrease in the height of the body (cf. Schlesinger, 1919, I., and Case 4 in Appendix). In one instance also spontaneous fracture of the femur occurred in a woman aged 32. Spontaneous fractures were observed by Edelmann also (loc. cit.).

Although it was not possible to say with certainty how much of the bone substance was affected, it was evident that the areas of acute pain on pressure corresponded to the points of attachment of certain

muscle groups—e.g., lumbar muscles, adductor muscles of the thigh, and the ilio-psoas. There was no opportunity for examining any histological specimens which might throw light on the process which took place at the painful sites, as we have no record of a fatal termination of any case of the disease that came under our observation. As far as we are aware the disease progressed until the patient was completely immobilised in bed, and succumbed ultimately to intercurrent disease (usually pulmonary) or to starvation, which unhappily was not an impossibility in Vienna in 1918–20.

Occurrence of Tetany.

Occurrence of tetany with osteomalacia has frequently been noticed and is of much interest. In 22 cases of hunger-osteomalacia Schlesinger (1919, II.) observed marked tetany in two cases (elderly women of 62 and 55 years respectively), and extra excitability of the muscles in 15 cases. He calls attention to the facts (1) that tetany is otherwise a rare condition in elderly people, and (2) that in cases of "hunger-osteomalacia" accompanied by tetany, symptoms of the latter disappeared simultaneously with those of osteomalacia. In two instances a subsequent relapse was again accompanied by tetany. Schlesinger (1920) distinguishes this condition as "hunger-tetanie," and points out that the symptoms are often asymmetrical in their distribution. Sauer (1920) described the case of a woman, aged 29 years, suffering from marked tetany and simultaneously from severe hunger-osteomalacia.

Definite tetany was observed by us four times in a total of 39 cases, but many patients complained of some degree of cramp in the feet, legs, or forearms. The most marked case that came under our notice occurred in a woman of 52, suffering from severe hunger-osteomalacia (see Case 5 in Appendix), who showed altered electrical response of the muscles, Erb's sign, Trousseau's sign, and Schlesinger's sign (tonic spasm of the foot when the leg is flexed at the hip to a right angle). In every case seen by us the symptoms of tetany subsided gradually after the patient was admitted to hospital. Contrary to Schlesinger's observation that tetany and osteomalacia symptoms were relieved simultaneously, in the case mentioned above (Appendix, Case 5), the tetany manifestations were greatly relieved before the treatment had shown much effect upon the osteomalacia symptoms.

Age- and Sex-Incidence.

Hunger-osteomalacia may be regarded as a disease which affects specially the portion of the population above middle age. Hume and Nirenstein's (1921) analysis of 131 cases treated as out-patients at the Zentral Verband der Krankenkassen shows that 115 (or 88 per cent.) were between the ages of 40 and 75 and 16 (or 12 per cent.) were under 40 years of age. Our notes of 43 cases show 36 (or 84 per cent.) between 40 and 70 years of age, and 7 (or 16 per cent.) between 20 and 40. Of 19 cases of hunger-osteomalacia studied by Edelmann (loc. cit.) in 1918 to 1919, 15 were women and 4 were men. In the cases observed by us in 1920 there was also a much higher proportion of women than men, but these included cases in convents. In the general population in 1920 the numbers of men and women affected were more nearly equal. Of 177 cases in which sex was noted by Hume and Nirenstein 99 (or 56 per cent.) were women and 78 (or 44 per cent.) were men. In this outbreak of hunger-osteomalacia, as compared with the better known osteomalacia of pregnancy, the most striking features were the incidence among elderly and old people, and the extent to which men were affected.

Influence of Occupation.

Evidence was not obtained to show that hard manual labour was a special contributory cause of hunger-osteomalacia. If the condition results from food deprivation, analogy with other deficiency diseases suggests that a relation would exist between the incidence of the disease and increased physical strain. Age, however, had more influence than occupation in determining the incidence of hunger-osteomalacia, and the hardest manual work was performed by individuals of an age (20–40) when some degree of protection from the condition seems to be afforded naturally. Moreover, in the existing economic crisis artisans and manual labourers were better paid and could secure a more abundant supply of food than other sections of the population, so that this additional advantage helped to protect such workers. Poverty and old age predisposed to the disease, and in many cases the food deprivation was specially severe and prolonged. In the convents the dietary was rigidly reduced, due partly to poverty and partly to the isolation in which these communities were placed. The lack of food was so extreme that younger occupants of the convents suffered as severely from the disease as the older nuns, and sisters appointed for light teaching duty were as much affected as those responsible for gardening and heavy household tasks.

Seasonal Incidence.

The seasonal incidence of hunger-osteomalacia was interesting. Many recurrent cases gave a history of first appearance of symptoms in winter 1918 or early spring 1919, with remissions in summer 1919 and relapse in the winter of 1919–20. The fresh cases seen by us had begun to suffer in the cold weather of the late autumn of 1919. The relief experienced in summer weather was probably due to higher temperature, but it is also possible that the disease was alleviated as a result of the improved diet associated with the summer season.

Ætiology.

The literature is full of observations, connecting osteomalacia and other disorders affecting the calcification of the bones with the activities of the ductless glands. A comprehensive abstract of the papers upon this subject is given by Zuntz (1912). Important observations in this field are those of Erdheim (1906) who, after extirpation by cautery of the parathyroids, produced a condition of tetany in rats, as well as abnormal dentine formation. Later (1914) the same observer found abnormal histological conditions in the parathyroids in a series of rats which developed rickets spontaneously. In addition (1907) he found at autopsy pathological changes in the parathyroids of human subjects who had suffered from osteomalacia of pregnancy. The theory advanced by Erdheim is that the normal secretion from the healthy parathyroid may have neutralising effect upon that of other glands, such as the ovary, which may, in certain conditions, affect the normal course of bone formation. Some support for this view is found in the association of osteomalacia with multiple pregnancy (Sonntag) and in the beneficial effect of castration upon such cases as described by Fehling (1891; 1895). Other observers have recorded the good effect of treating osteomalacia with adrenalin (Bossi (1907), Edelmann, loc. cit.); and extract of the hypophysis was employed with good effect in osteomalacia by Bab (1911), Neu (1911), Pal (1912), and in rickets by Klotz (1912). Biedl (1916) reached the opinion that the cause of osteomalacia is to be found in the disordered action of more than one gland.

It has been well recognised also that external conditions have an influence upon the incidence of osteomalacia. Sonntag (1905) states that although everywhere a rare disease it is unusually frequent in certain places, such as the valley of the Rhine and its tributaries, Lombardy, the Danube Island Schütt in Hungary, and the Harz Mountains. The disease is comparatively rare in North Germany, in the United States, and in England, where it is described only in association with pregnancy. Sonntag also connects the occurrence of the disease in pregnancy with damp dwellings, poor diet, insufficient clothing, hard work, and excessive care and worry, in a word with poverty, and he calls

attention to the good effect which improved conditions of life exert upon the disorder. It is the opinion of Schlesinger that more careful observation and accurate diagnosis will discover the disease to be more widely distributed than has been hitherto supposed.

The causation of osteomalacia has hitherto been generally ascribed to disordered calcium metabolism, attributable to abnormal action of endocrine glands and associated with poverty and destitution. This conception of its ætiology is also adopted by Edelmann and Schlesinger, who consider that hunger-osteomalacia is brought about by the effect of undernourishment upon the activities of one or more of the ductless glands. The fact must be emphasised, however, that the connexion between "hunger-osteomalacia" and osteomalacia that occurs in pregnancy is far from clear. Despite the widespread distribution of "hunger-osteomalacia" among the older section of the population of Vienna, no increased incidence of the typical osteomalacia of pregnancy was reported among child-bearing women, and the conditions favourable to the occurrence of "hunger-osteomalacia" must, in general, be regarded as different from those that determine the onset of the disease in pregnancy.

Specific Deficiencies in Diet as a Possible Cause of Hunger-Osteomalacia.

The consideration of diet as a factor of specific importance in producing osteomalacia of pregnancy does not seem to have been undertaken. Fehling, however, refers to the possibility of averting the disease by improved diet. In the outbreak here recorded the question of diet was of primary importance, and prophylaxis and cure were effected by diet alone.

In considering external conditions in Vienna during the past five years, the most striking unusual circumstance has been the food deprivation suffered by the population. There is no doubt in the minds of those who studied the outbreak of hunger-osteomalacia in Vienna in 1918–19 that the condition was, indirectly at least, dietetic in origin. This is made clear by the resolution introduced by Prof. Dr. Schiff, and adopted unanimously by the Gesellschaft der Aerzte at their session on March 14th, 1919, calling the attention of the Inter-Allied Food Mission to this famine disease, and begging for quick and generous supplies of food as the best means of dealing with it.

The food supplies of the city of Vienna diminished progressively from 1917 onwards, and during the winter of 1918–19, and of 1919–20, were reduced to a minimum. The diets of the patients examined by us had consisted mainly of bread and vegetables, with small amounts of flour and sugar. Milk, butter, and eggs were unknown; meat was not consumed, the price being prohibitive, and the only fat in the diet was a small and irregular supply of lard. It was the opinion of some that the disease, although confined at that time to the poorest class in the city, was not strictly a starvation disease, but was rather the result of a qualitative deficiency in the diet caused by lack of certain definite foods. The patients were always thin, but not emaciated, and while the process of cure in hospital was invariably accompanied by increase in body-weight, the successful treatment of out-patients was accomplished without any such gain in weight. Lack of fat was the most striking deficiency in the patients' diets prior to the development of osteomalacia.

The value of certain fats in diet has been much emphasised recently by the results of experimental work upon growth in young animals.

The work of Falta and Nogerrath (1905), Stepp (1911, 1912), of McCollum and his co-workers (1913–1916), and of Osborne and Mendel (1913, 1915), has shown that in young rats growth may be entirely inhibited by a diet adequate in calories and in protein supply if certain fats are absent, and will be restored if a small amount of these fats be again included in the diet. This result was attributed by McCollum not to the fat in itself but to the presence of a certain vitamin or accessory factor dissolved in the fat; this vitamin he called the "fat-soluble A factor." It is present to some extent in most fats, but those of animal origin, such as fish-liver oils, beef fat, mutton fat and butter, contain it in greater concentration, cod-liver oil being particularly rich in this vitamin. The existence of this factor in green leaves has also been established.

It is to be remembered that one view of the ætiology of the analogous disease rickets is that the disease may be attributed to a lack of fat in the diet of infants (Cheadle (1906), Still (1907), Holt (1907)). In Austria cod-liver oil containing an addition of phosphorus is a classic remedy for rickets, and has been widely used for osteomalacia, but the view commonly held is that the beneficial result that follows is to be ascribed to the phosphorus rather than to the oil, although the investigations of Schabad (1909, 1910) upon calcium metabolism in rickets, before and during treatment, have shown that the cod-liver oil rather than the phosphorus is to be regarded as the active constituent in increasing the retention of calcium. Schabad also investigated the effect upon calcium metabolism of sesame oil and, in conjunction with Sorochowitz, of olive oil. These oils were found to influence calcium retention in a degree which was insignificant by comparison with that of cod-liver oil.

These results of Schabad have received interesting confirmation from the recent work of Mellanby (1918, 1919) upon experimental rickets in young dogs. Rickets occurred in puppies fed upon diets poor in fat-soluble vitamin—i.e., containing fat in the form of olive oil or lard, but not when cod-liver oil or butter was substituted for these fats. Mellanby has advanced the view that rickets is a dietetic disease caused by a deficiency in the diet, not of fat per se, but of some factor contained in certain fats. Three studies on experimental rickets in rats have appeared recently by McCollum, Simmons, Parsons, Shipley and Park (1921). In their experiments rachitis and similar disturbances of osteogenesis were produced by deficient diets, and they have demonstrated that some substance in cod-liver oil causes calcium to be deposited in the same fashion in which deposition occurs in spontaneous healing of rachitis. Their observations lend support to the view that an anti-rachitic factor present in animal fats plays some rôle in the normal process of ossification. Hess (1917, 1920, I. and II.), while admitting the prophylactic or curative action of cod-liver oil upon rickets in children, considers that lack of the fat-soluble A vitamin is only one among several factors concerned in causation of the disease.

Concurrently with the outbreak of "hunger-osteomalacia" in Vienna, during 1919 and 1920, there has been an unusual prevalence of rickets among infants and young children, and of late rickets among young adults. This suggests that all these disorders may have a common origin, and may represent a reaction to some unusual circumstance interfering with normal metabolism and the proper nutrition of the bony tissues.

The identity of rickets and real osteomalacia from the anatomical standpoint has been strongly supported by the histological work of Pommer (1885), Looser (1908, 1920), and others. The different theories which have been advanced regarding the ætiology of osteomalacia and of rickets form two parallel series. For each disease there are theories involving (1) disordered action of the ductless glands, (2) defective hygiene, (3) defective diet, and (4) bacterial infection (Morpurgo, 1900, 1902, 1907). The occurrence of tetany with osteomalacia, and the association of this condition in childhood with rickets, form another important parallel between the two diseases. With such indications of correspondence between rickets and osteomalacia, it was of the greatest interest to ascertain whether evidence in support of a similar dietetic theory for both diseases could be obtained during the outbreak of hunger-osteomalacia in Vienna.

Result of Dietetic Treatment upon "Hunger-Osteomalacia."

From earlier observations it was known that simple rest in bed with good diet was a successful form of treatment for the lighter cases of hunger-osteomalacia. Cod-liver oil containing phosphorus was highly esteemed as a curative substance, the phosphorus being regarded as the active agent. When cod-liver oil could no longer be obtained in Austria, different vegetable oils, with additions of phosphorus, were employed for treatment. In certain cases good results were reported from the

use of phosphorus in the form of pills without oil (Schlesinger, 1919, I.); this treatment, however, was not tried with out-patients, but coincided with admission to hospital and a generally improved dietary. A similar criticism applies to the good results from the use of extract of thyroid gland reported by Edelmann (loc. cit.).

In view of the possible connexion between the known high content of cod-liver oil in fat-soluble A accessory factor, and the efficacy of the oil in the treatment of osteomalacia, it was desirable to try to determine the therapeutic value, in this disease, of various fats known to contain the fat-soluble A accessory factor in different degree. The results obtained are set out in detail below. They show that the symptoms could be relieved, in absence of any other treatment, by one each of the series of fats employed, but that cod-liver oil was the most potent. Zilva and Miura (1921) have succeeded in making quantitative estimations of the relative content of A vitamin in different fats, and in experiments with rats have found some samples of cod-liver oil to be 250 times as potent as butter.

TABLE I.—*21 Cases of Osteomalacia in Convents.*

The additions to the diet were arranged to be approximately equal in calorie value.

Group.	Addition to diet.	Approx. amount daily, g.	Calories.	Fat per day, g.	No. of cases.	Result.
(*a*)	Sugar or syrup. Cereal. Olive oil.	15 40 15	330	15	10	Good progress in 5 slight cases; no progress in 5‡.
(*b*)	Margarine.* Olive oil.	25 20	380	43	5	Good progress slightly inferior to (*c*).
(*c*)	Butter. Cod-liver oil. Egg (dried).	25 10 =1 egg	360	40	11†	Good progress.

* This sample of margarine was believed to be manufactured from vegetable fats, it has since been ascertained that it contained 80 per cent. animal fats.

† Later including 5 from group (*a*).

‡ Three of the 5 cases in which no progress was made were severe, and showed good improvement when treatment (*c*) was substituted.

TABLE II.—*18 Severe Cases of Osteomalacia.*

Observations taken in the III. Medizinische Abteilung at the Allgemeines Krankenhaus (Prof. Dr. H. Schlesinger), February–April, 1920. The effect of various additions to the ordinary hospital diet.

(*a*)	Sugar or syrup. Rice or other cereal.	60 100	550	0	5	See below (1).
(*b*)	Margarine.*	50 (25 at first.)	540	60	13	Steady progress in 8 cases; very slow progress in 5.
	Olive oil.	15				
(*c*)	Butter.	50 (25 at first.)	400	52		
	Egg (dried).	=1 egg				
(*d*)	Cod-liver oil.	60	540	60	4	See below (2).

(1) Very slow improvement in 20–30 days; marked progress when changed to (*b*), (*c*), (*d*).

(2) Marked improvement in 4 severe cases, making slow progress on (*a*), (*b*), and (*c*).

The food supplies of Vienna in general were most irregular, and it was not possible to arrange special diets which could be controlled in every particular. Except for a few important cases we had to be content with watching the effects of various additions to the ordinary diet, whether in hospital, convent, or home. Without exception such ordinary diets were always deficient in fat and always scanty. The following foods were, therefore, chosen for the different groups into which the patients were divided, and in comparative observations the additions made were roughly equivalent in calorie value. (*a*) Sugar and cereals; (*b*) vegetable oils (margarine, olive oil, &c.); (*c*) butter and eggs; (*d*) cod-liver oil; (*e*) vegetable oil containing phosphorus; (*f*) green vegetables. After admission to hospital some improvement usually followed from rest in bed, and relief from the misery caused by moving about, but such effects were only temporary, and relapse occurred if no increase were made in the fat-content of the dietary. (Tables I. and II.)

(*a*) *Influence of Sugar and Cereals—i.e., extra calories without extra fat.*—These additions were made to the ordinary hospital diet of five severe cases in the Allgemeines Krankenhaus (see Table II.). Slow improvement was noted in three to four weeks, but only one case progressed sufficiently to leave hospital; the other four cases required a further period with treatment by addition of (*b*), (*c*), or (*d*) before they could be discharged (e.g., Case 2 in the Appendix). Ten cases in a convent (see Table I.) also had their diets enriched with extra cereals and sugar, but here a small amount of olive oil (15 c.cm. daily) was also added. Progress was noted in five of the lighter cases only, and not in the remaining patients. (Table I., group (*a*).)

(*b*) *Influence of Vegetable Fats and* (*c*) *Butter and Eggs.*—The treatment of a series of cases with these additions was arranged (see Tables I. and II.) in the belief that the ordinary vegetable oils of commerce might be regarded as free of the fat-soluble accessory factor, a view in accord with results obtained by McCollum and by Osborne and Mendel and their co-workers (loc. cit.). Such additions would therefore have demonstrated the effect of adding fat to the diet uncomplicated by the presence of the vitamin. We found, however, that the effect of vegetable fats differed only in degree from that of butter and cod-liver oil, since cures followed the use of each of the fats administered, but when vegetable oils were used, the good effect appeared more slowly and in severe cases was less complete. (See Case 1 in Appendix.) The margarine employed was selected in the belief that it contained only vegetable oil, but on subsequent inquiry from the manufacturers it proved to contain 80 per cent. of animal fats. No marked difference was observed in the response to treatment of 24 cases divided into two groups, one of which received margarine and olive oil, and the other butter and egg as dietetic additions. (See Tables I. and II., groups (*b*) and (*c*).)

(*d*) *Cod-liver Oil.*—This was the most effective fat tried, and no case failed to recover when this oil was added to the dietary in sufficient amount. Doses of cod-liver oil equal to 60 g. daily effected speedy cure in severe refractory cases after other forms of treatment had failed. Cases 5, 6, 7 in the Appendix are instructive instances.

Case 6, George R., aged 60, was specially severe, suffering acute pain with the least movement. As additions to the hospital diet, he received margarine and olive oil in amounts equal to 65 g. of fat daily for 40 days, but no definite change took place in his condition. 30 g. of cod-liver oil daily were then given for seven days, and were not effective; but on increasing the daily dose to 60 g. cod-liver oil there was a dramatic improvement in his symptoms within a week, and in three weeks his gait was easy and painless. This case illustrates well the necessity for giving the requisite amount of the right sort of fat.

Case 7, Christina B., was the most severe case encountered. She had been unable to walk for three months before entering hospital, could not stand without support, and was helpless except for slight movements in bed made with the help of her hands. In addition to the ordinary hospital diet she received at first 25 g. and later 50 g. of butter and one egg each day for 31 days, and for part of this time phosphorus pills were also given. At the end of this period scarcely any improvement was noticeable. After changing her extra allowance to 60 g. of cod-liver oil daily, marked progress was evident after five days and the patient was discharged after 14 days of this treatment.

One very refractory case was that of Mater U. (Case 4, Appendix), a delicate woman, aged 52, who could not tolerate cod-liver oil. Treatment for 17 days with 20 g. butter daily, plus extra milk and eggs, was very disappointing, but after increasing the butter ration to 50 g. daily and the milk to ½ litre, there was slow steady improvement and the patient was able to walk without her stick after 10 days. Another severe case in the same convent (Mater P., aged 57, Appendix, Case 3) treated at the same period with 20 g. butter daily and with 15 g. cod-liver oil instead of milk or eggs, made rapid progress and admitted immediate relief from pain.

(*e*) *Influence of Vegetable Oil to which Phosphorus was added.*—Miss Hume and Dr. Nirenstein made a special series of investigations to determine the comparative value of cod-liver oil and of vegetable oil containing phosphorus with 131 out-patient cases selected from about 500 at the central station of the Verband der Krankenkassen. A detailed analysis of these observations is published by the

authors in a separate communication, but they have permitted their general conclusions to be stated here. Cod-liver oil was found to be definitely superior to rape oil containing phosphorus (0·01 per cent.), and large doses of the plant oil (200 g. weekly) gave a rate of improvement about equal to that obtained with smaller doses of cod-liver oil (100 to 150 g. weekly).

(*f*) *Influence of Green Vegetables.*—In order to throw light on the question whether fat or the fat-soluble accessory factor was to be regarded as the effective agent in treatment, it was important to ascertain whether green vegetables (another source of the fat-soluble A vitamin) had any curative effect on this disease. The history of relief in summer and return of symptoms in winter given repeatedly by recurrent cases suggested that this might be the case. It was difficult to put the theory to a practical test, for most of the patients were old or elderly and feeble, and a diet devoid of fat and containing large amounts of cabbage, salads, and spinach would not have been tolerated. Also it was impossible to arrange such a diet in the period January–April, 1920, when most of our observations were made. An attempt was made, however, in the case of a woman, aged 30, who entered hospital at the beginning of May, suffering severely from hunger-osteomalacia. Her diet was strictly controlled and contained as much green vegetables as could be tolerated and 5 g. only of fat in the form of olive oil. The patient consumed an average of 700 g. of green vegetables daily, but made no appreciable progress in 18 days. Her diet was then changed and the green vegetables replaced by 30 to 40 g. of cod-liver oil and 20 g. butter daily, and improvement took place rapidly after the change. The case is described in detail in the Appendix, Case 8.

General Character of the Recovery.

The general character of the recovery was always the same, but occurred more rapidly in hospital patients than in those treated as out-patients and carrying on their ordinary occupations at home. After a few days on effective treatment body movements became less painful and the patient could stoop or turn more readily. The gait often improved within a week, and although it retained a waddling character it was less stiff and showed a more natural movement at hips and ankles. Within the second week there was often great remission in the pressure pains, and the abduction pain was usually less. As a rule the pains caused by compression of the ribs continued longer, and the upper ribs were free from pain earlier than the lower ribs. The most obstinate symptoms were always the pains on movement in the lumbo-sacral region and in the tarsal bones, but these disappeared within 4–6 weeks, and did not tend to recur if suitable amounts of fat were taken regularly as a prophylactic.

The eight cases described in detail in the Appendix were selected to illustrate various types of symptoms and different methods of treatment. In many the comparative value of the respective additions to the diet is well seen from the alteration in the rate of recovery when one treatment was substituted for another.

Summary and Conclusion.

1. The occurrence of "hunger-osteomalacia" in Vienna during the period of greatest food deprivation, its incidence among the poorest inhabitants and the beneficial effect of improved diet without any other form of treatment, suggested that the disease was of dietetic origin.

2. The disorder affected chiefly middle-aged and old people of both sexes. The characteristic symptoms of the condition are pain on body movement, a waddling gait, difficulty in mounting stairs, severe pain in sacral region on pressure or movement, and pain in the ribs on compression of the thorax. Tetany may occur in association with the disease.

3. Forty-eight cases were treated by making additions to patients' diets in the form of carbohydrates, cereals, and fats of various kinds.

4. Little improvement could be demonstrated after addition to the diet of sugar or cereals (i.e., extra calories without fat), although in many instances the previous diet had been very scanty.

5. Recovery followed the addition of either cod-liver oil, butter, oleo-margarine containing 80 per cent. of animal fat, or olive oil. The beneficial influence was in the order named above, cod-liver oil being far the most effective. Some of the severer cases did not improve until cod-liver oil was given.

6. That the relative therapeutic value of the fats used corresponds roughly with their content in the fat-soluble A vitamin is regarded as significant.

7. It is also possible to interpret the remission of symptoms of "hunger-osteomalacia" in summer and their relapse in winter as due to varying supplies of vitamin A in the diets, for, during summer, inclusion of green vegetables in the diet provides a valuable source of this vitamin. One attempt, however, to cure a severe case with a fat-free diet, rich in green vegetables, was not successful. More observations are needed on this point.

8. The increase in Vienna of rickets in children and late rickets in young adults, simultaneously with the occurrence of "hunger-osteomalacia," suggests that the three disorders may be due to the same cause.

In conclusion we wish to express our thanks to those members of the medical profession in Vienna who have afforded us the opportunity of carrying out this investigation. We are specially indebted to Prof. H. Schlesinger, of the III. Medizinische Abteilung of the Allgemeines Krankenhaus, who permitted us to make special study of cases in his wards, and gave us the benefit of his previous extensive experience. Our thanks are also due to Prof. K. F. Wenckebach and Dozent Dr. Porges of the I. Medizinische Klinik of the University, and to Prof. Dr. Schiff of the Zentral Verband der Krankenkassen; also to those members of the nursing staff who cheerfully undertook all the extra work involved in the preparation of special diets.

For the supply and transport of special foodstuffs we have to thank the British Section of the Inter-Allied Food Mission then stationed in Vienna; and we desire also to record our thanks to the Mission of the Society of Friends working in Vienna for much help and coöperation, especially in supplying from their stores particular articles of diet essential for our investigation.

APPENDIX.

Following are the notes on eight cases:—

CASE 1.—Antonia B., aged 48; admitted March 20th, 1920. Severe recurrent case; symptoms first noted in July, 1919, improved in August and September, 1919, and reappeared in January, 1920. On admission patient had shuffling gait and complained of great pain on walking and on all movements involving the trunk muscles. She had acute pain on compression of ribs and on sudden abduction of flexed thighs. Pain was elicited on pressure over inner border of tibia, shaft and condyles of femur, and over iliac crests; also along shaft of each humerus, especially at insertion of deltoid muscle.

Treatment.—60 g. of olive oil daily with carefully controlled diet of fat-free milk, cereals, pulses, and fruits. Calorie value of diet 2500 daily. Protein content 60–65 g.; fat content 60 g. This diet was begun on third day after admission and continued unchanged for 32 days, and the patient's weight increased by 3·3 kg. Progress—Gait improved within six days of admission. After nine days' treatment: distinct general improvement; gait still stiff but no longer waddling and patient can take longer steps; can get in and out of bed more easily; less pain on compression of ribs. Eighteen days: great progress; gait normal; can spring from bed without use of hands; no pain on abduction of thighs; pressure pain persist over lower ribs and sacrum, and over ankle-joints and tibiæ. Twenty-five days: pains in ankles still present; no other symptoms; discharged cured April 24th, 1920, but symptoms recurred.

CASE 2.—Anna H., aged 65; admitted Jan. 15th, 1920. Symptoms: stiff waddling painful movements on walking; acute pain on compression of ribs and abduction of thighs; some pain on pressure over pubic symphysis and rami.

Treatment.—(*a*) Diet enriched by abundant extra cereals and carbohydrates without addition of fat on eighth day after admission. After 15 days' treatment, all symptoms unchanged. (*b*) 50 g. margarine (containing 80 per cent. of animal fats) and 15 g. olive oil added to daily diet. After 10 days' treatment: gait much improved; pressure pains in ribs persisting. Seventeen days: normal gait; slight pain on compression of ribs; no other symptoms; patient discharged Feb. 26th, 1920.

CASE 3.—Mater P., aged 57. Treatment begun Jan. 10th, 1920, in convent. Symptoms present for past two years, with remissions during summer months. Severe case, and walks only with great difficulty. Marked pressure pain over

ribs, lumbar vertebræ, and sacro-iliac joints; has pre-tibial œdema and when trying to walk has cramps in both feet.

Treatment.—(*a*) Extra calories, consisting of cereals and carbohydrates with 15 g. daily of olive oil. After 16 days' treatment, no improvement. (*b*) Butter 25 g., cod-liver oil 15 g., and one egg given as additions to the daily diet. After eight days' treatment, improvement in pressure pains and in body movements; walking somewhat less painful. Twenty-three days: can walk rapidly without use of stick; movements of body free and painless; no pains on pressure over ribs or sacrum; some pain and œdema persist in feet. General condition greatly improved; prophylactic doses of cod-liver oil continued.

CASE 4.—Mater U., aged 52; treated from Jan. 10th, 1920, in convent. Symptoms have been present for two years and are specially severe. Patient emaciated, and gives definite history of decrease in height and shortening of arms. Walking and all body movements cause intense suffering, and pressure pains are acute over ribs, sacro-iliac joints, lumbar vertebræ, hip-joints, dorsum of foot, and calf muscles. Has tendency to spasm of foot.

Treatment.—(*a*) Extra calories as for Case 3. After 14 days' treatment, no improvement. (*b*) Butter 25 g. and one egg daily, in addition to ordinary diet; cod-liver oil 15 g. daily was also ordered, but could not be tolerated by this patient and was not taken. After 17 days' treatment, no improvement. (*c*) Butter 50 g., one egg, and 250 c.cm. milk daily in addition to the ordinary diet; total extra fat 60 g. After 14 days' treatment: marked improvement; slight pressure pains persist over sacrum and lower ribs, but not elsewhere; gait still stiff, but walking is no longer painful and for four days patient has not used her stick; body movements in bending, sitting, or standing still limited but greatly improved. Prophylactic treatment continued with smaller doses of butter and milk daily.

CASE 5.—Maria B., aged 62; admitted Jan. 13th, 1920. A severe and refractory case, complicated by tetany. Symptoms have been present for past year in ribs and sacral region. For some months patient has been unable to walk owing to pain caused by body movement and has remained in bed; she can turn in bed and raise herself only with great difficulty and with use of hands. Tetany well marked; Trousseau's sign and Erb's sign positive.

Treatment.—(*a*) Extra calories in form of cereals and carbohydrates; anti-neuritic vitamin also given as marmite, 10 g. daily. After 10 days' treatment: no change in general condition; all symptoms still present, and tetany well marked. (*b*) Butter 25 g., one egg and marmite 10 g. daily in addition to ordinary hospital diet. After 10 days' treatment: no improvement; patient is unable to walk, and pressure pains are unchanged; tetany symptoms are less marked but still present. Since admission increase in body-weight of 2·4 kg. (*c*) Cod-liver oil 60 g. daily. After 10 days' treatment: marked progress; can walk a little and gets in and out of bed without difficulty; great diminution in pain on compression of ribs and on abduction of thighs; knees still painful and slight ankle-clonus present; tetany symptoms much less marked. Twenty-one days: pressure pains persist though slighter in degree; abduction test negative; gait still stiff. Thirty-five days: pressure pains have disappeared; no abnormality of gait, and patient walks slowly without pain; complains only of pain in ankle-joint and along shaft of femur on right side. Discharged March 15th, 1920.

CASE 6.—George R., aged 60; admitted Jan. 14th, 1920. Body-weight 58·5 kg., height 171 cm. Very severe case, with history of onset of symptoms nine months previously. First noticed œdema of legs and pains in ankles; thighs and ribs were later affected. All movements are so painful that patient is now practically helpless; cannot stand without support, and in bed can change position only by use of hands and arms. Has acute pain on compression of ribs and sternum, and on abduction of flexed thighs.

Treatment.—(*a*) Extra margarine 25–50 g., olive oil 15 g. daily, in addition to hospital diet. After 25 days' treatment: margarine 25 g. daily, no improvement. Margarine then increased to 50 g. daily for a period of 10 days; slight improvement, but still unable to walk. (*b*) Cod-liver oil 30 g. daily, later 60 g. After two days' treatment: immediate diminution in pressure pains; rib symptoms less marked; walking no easier. Seven days: rib symptoms almost disappeared; still cannot stand without support; cod-liver oil then increased to 60 g. daily. Fourteen days: pressure pains and abduction pain very slight; can walk slowly without support and with little pain. Twenty-one days: condition very satisfactory; walks well and makes free movements of bending, sitting, and standing. Twenty-eight days: traces only of pressure pains elicited; gait normal and patient walks without pain or fatigue. The general condition is very good and weight has increased 9 kg. since admission to hospital. Discharged March 22nd, 1920.

CASE 7.—Christina B., aged 50; admitted Feb. 5th, 1920. The most severe case that came under our notice. Symptoms have been present without remission since previous spring, and for four months before admission patient has been helpless in bed. Pressure pains over ribs, sternum, pelvis, and lumbo-sacral region are intense, and acute pain follows abduction of flexed thighs. Patient stands feebly when supported, but cannot take a step nor carry out any body movement owing to the agonising pain that accompanies muscular effort.

Treatment.—(*a*) Butter 50 g. and one egg daily, in addition to ordinary hospital diet. After 14 days' treatment: patient is freer from pain, can sit up in bed slowly and get in and out of bed with difficulty; cannot walk. From this date phosphorus pills given, equivalent to 0·0005 g. phosphorus daily. Twenty-five days: no progress in movements and condition still very helpless; pressure pains still acute, especially in ribs; no result observed from treatment with phosphorus. (*b*) Cod-liver oil 60 g. daily to replace former additions to diet; phosphorus pills omitted. After five days' treatment: pressure pains much less; abduction test causes slight pain. Patient shows great improvement and has lost expression of suffering; can sit up in bed without using hands, but still has great difficulty in getting in and out of bed and has to flex thighs with hands; can stand alone with feet far apart, and can take a few steps with support. Fourteen days: trace of pain on compression of ribs but not elsewhere; can move from bed slowly without pain, stands without support, walks with help of stick; has shuffling gait. Discharged March 17th, 1920.

CASE 8.—Rosa T., aged 30; bookbinder; admitted May 20th, 1920. The unusual feature of this case was the occurrence of the disease in a severe form in so young a woman; symptoms had been present and progressing for more than a year, but patient had only given up work two weeks before entering hospital. On admission gait was stiff and steps were short and shuffling; all body movements, such as bending or getting into or out of bed, were difficult and painful and were only possible when aided by hands; pain was caused by pressure over frontal, malar, and nasal bones, ribs, lumbar vertebræ, sacro-iliac joints, shaft of femur, and borders of tibiæ; pain on abduction of flexed thighs very acute.

Treatment.—(*a*) Fat-free diet, with addition of green vegetables. Daily food-supply was equivalent to 2000 calories, and consisted of bread, rice, oatmeal, peas, beans, lentils, cocoa, sugar, and chocolate. In addition a large amount of green vegetables was consumed, the daily allowance being at first 400–500 g., and later 700 g. Vegetables used were spinach, lettuce, cabbage, cress, asparagus, and cucumber. For cooking purposes 5 g. of olive oil daily was allotted; this diet was continued for 18 days. Progress: After 18 days' treatment patient had gained 1 kg. in weight. Distribution and degree of pains on pressure were unaltered; gait was still stiff and body movements difficult though less so than before. Progress of case was not satisfactory and patient was disinclined to take larger amounts of green vegetables, so it was decided to discontinue treatment on these lines. (*b*) 60 g. of animal fat added to the diet daily, and no green vegetables given; cod-liver oil 30 g., butter 20 g., and one egg were given daily and 50 g. of dried full milk were substituted for the fat-free milk. Total calories 2500; protein 60 g. After 12 days' treatment: gait much more free, and body movements made with ease and without use of hands; abduction of thighs causes very slight pain, and all pressure pains have disappeared or are diminishing; increase in weight since admission of 3 kg. In general a marked improvement in patient's condition.

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II.—COMPARATIVE TREATMENT OF CASES OF HUNGER-OSTEOMALACIA IN VIENNA, 1920, AS OUT-PATIENTS WITH COD-LIVER OIL AND PLANT OIL.

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Report to the Accessory Food Factors Committee appointed jointly by the Lister Institute and the Medical Research Council.

AN investigation on 177 out-patient cases of hunger-osteomalacia was made at the central office of the Verband der Krankenkassen Wiens und Niederösterreichs, VI. Königseggasse 10, Vienna. The chief medical officer, Prof. A. Schiff, very kindly offered every possible facility for the research. The investigation took place between February and June, 1920. The central office of the Verband der Krankenkassen is the chief office of a large sick benefit organisation which has a number of branch offices distributed throughout Vienna. The subscribers, when ill, notify the fact to their local branch office and are usually treated there, but in the case of hunger-osteomalacia the method was adopted of sending all patients to be treated at the head office. Presumably this line was taken because the disease was previously unknown and the best method of treatment was not established.

During the year 1919, when the disease was first recognised, 924 new cases presented themselves for treatment between March and December. In the first six months of 1920, 620 new cases came up for treatment, and in addition many old cases were attending regularly. From this mass of material about 200 suitable patients, in whose case the diagnosis was clear and unobscured, were selected for special study in the month of February.

Previous Treatment and Special Features of the Krankenkasse Cases.

The previous treatment at the Krankenkasse had consisted in dosing the patients with a plant oil containing phosphorus (0·01 g. P. per 100 g. oil), a treatment based on the belief that phosphorus has a curative value.* Bottles containing 100–150 c.cm. of the oil were dealt out and patients were supposed to come up weekly for a new bottle, but in practice, living as they did at great distances from the central Krankenkasse, and being severely handicapped in moving about by their painful disease, they did not come so often. All that can be said as to the dose taken, therefore, is that it was never more than about 20 g. of the oil a day and seldom as much. Many patients stated that they had felt no improvement while taking the oil and many were certainly in a deplorable condition when first seen, although they had had treatment for many months.

Before dealing with the special study there are some points of general interest in connexion with this large group of cases which deserve mention.

Age and Sex of Patients.—The patients were of both sexes, with some preponderance of the female sex; out of 177 cases 44 per cent. were male and 56 per cent. female. It is possible that the female sex is actually more liable to the disease, but it is probable, on the other hand, that the preponderance was due to economic causes—namely, to the greater poverty and consequently worse food of old and single women dependent on their own earnings, for such the cases chiefly were. The patients were all very poor; the largest numbers of cases came from the 10th, 12th, and 16th Bezirks, which are the poorest districts in the city. Many of the cases were very old, and although it is probable that old age does increase the liability to the disease, here also the economic factor cannot be neglected. Of 131 cases whose ages were noted all except 16 were over 40, and more than one-third were between 60 and 70 (see Fig. 1). On the other hand, some persons of all ages from 19 to 77 were seen who were suffering from the disease. At the younger age-limit, under 25, the disease merges into the syndrome of rachitis tarda, of which 10 cases were seen among the 177 selected patients; one or two cases were seen which appeared to be transition cases, and showed the symptoms characteristic of osteomalacia and rachitis tarda at the same time.† Many patients were too old to be in work, and the rest were drawn from a number of different trades, but by far the larger number were unskilled workers.

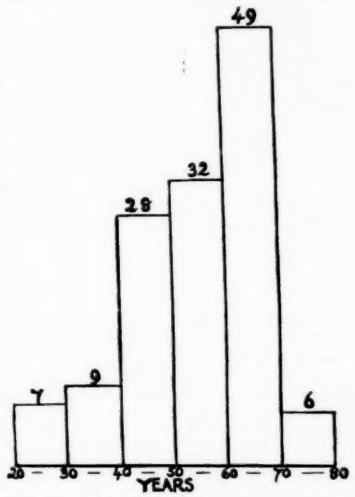

FIG. 1.—Distribution of ages among 131 cases of hunger-osteomalacia.

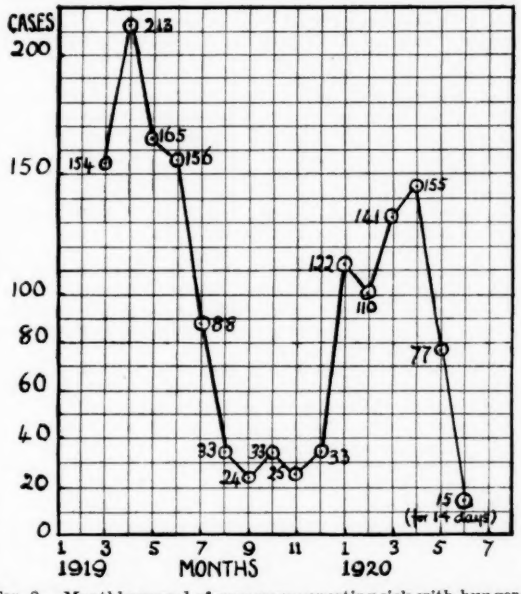

FIG. 2.—Monthly record of new cases reporting sick with hunger-osteomalacia at the Krankenkasse, March, 1919–June, 1920.

Diet.—The diet, particularly in the winter, had consisted principally of bread and kraut, the white heart of the autumn cabbage, as opposed to the green kohl, together with root vegetables. Hunger-osteomalacia shows a marked seasonal incidence in winter and spring, corresponding with, it is believed, the season of worse diet. The curve (Fig. 2)

* See Schlesinger, 1919; Clairmont and Schlesinger, 1914.

† For a full account of these symptoms see Edelmann, 1919; Schlesinger, 1919; Chick and Dalyell, 1921.

was provided by the kindness of Prof. Schiff, and shows the numbers of new cases reporting themselves each month for treatment during 1919 and 1920. The number of new cases reporting sick may be taken as a measure of the prevalence of the disease. Although no patient, as a rule, reported for treatment until he had been ill a month or more, yet patients would not be likely to report for treatment unless they felt themselves getting steadily worse. In each year the apex of the curve comes in the same month—April—but in 1919 fresh cases appeared in considerable numbers through May, June, July till August, when there was a sudden rapid drop. At the time when this drop occurred in 1919 Prof. Schiff reports that he attributed it to the arrival of a large consignment of American bacon in the city. In 1920, however, the great drop in the number of fresh cases came in May, and in June they had fallen to a very low figure indeed, so that this period in 1920 corresponds with August in 1919. In June, 1920, there was no special large influx of American bacon or of any other foodstuff into Vienna, and it seems probable that the much more rapid diminution in the number of fresh cases in 1920 as the year advanced must be attributed to the exceptionally early spring following on a winter of no severity. The early spring produced salads, green vegetables, and a little meat at a price which the poor could pay six weeks or two months earlier than would normally be the case.

The actual possible bearing of the supply of green vegetables on the ætiology of the disease is discussed elsewhere, but it is as well to make it clear that it is not believed that scurvy played any part. No symptoms of scurvy were ever seen or reported among the patients and the great predominance of white cabbage and roots, even though well cooked, in the diet producing hunger-osteomalacia, makes any incrimination of scurvy almost unthinkable.

Special Investigation of 177 Cases: Methods Employed.

Since one of the writers (E. N.) was a regular member of the Krankenkasse medical staff, it was possible to see the patients in the ordinary course of Krankenkasse business and to distribute treatment through the channels already organised. The treatment given in this investigation was therefore, in many ways, a continuation of the previous treatment and may very fairly be compared with it. It was proposed to treat roughly one-third of the cases with 200 g. weekly of cod-liver oil,‡ one-third with 100 g. weekly, and one-third with 200 g. weekly of the vegetable oil containing phosphorus, "phosphor oel," which had previously been used in Krankenkasse treatment, and to observe the result. The cod-liver oil used for treatment was obtained through the kindness of several of the relief missions, the Friends' Emergency and War Victims' Relief Committee, the Vienna Emergency Relief Fund, and the International Spitalshilfsaktion, and was the ordinary refined cod-liver oil of commerce. The vegetable oil came from the Vienna municipality central fat control and was unfortunately of unknown origin; a sample has, however, been brought to England, and it is hoped to identify it and test its growth-promoting powers on rats. (See Appendix.)

The method adopted in dealing with the patients was to see them in turn and question them as to the duration of their illness and the mode of onset of symptoms, and any previous treatment which they might have received. The disease was often reported as of long standing (1–36 months). In cases which had been ill for more than a year, a remission was generally admitted in summer, followed by a relapse in winter. Many patients were entirely untreated, others had had treatment with phosphor oil or had been taken into hospital. A few cases treated in hospital had enjoyed remarkable improvement, but just as often this was not the case and none spoke enthusiastically of cure in the past. Almost all cases said that pains had appeared first in the feet and legs, later in the sacrum, and later still in the ribs, but this order of development was not universal.

‡ In the whole series of cases only one was found, Marie P., who was unable to tolerate the large amount of oil; on small quantities she made only very slow progress; on large quantities she lost appetite, her digestion became disordered, and the pains due to osteomalacia became more severe.

Three special symptoms were selected as a standard of severity, the gait, the degree of difficulty manifested in trying to go upstairs, and the tenderness of the ribs to pressure; for this last symptom it was usually enough to watch the patient's face while exerting pressure on the ribs. According to the severity of each, half, one, two or three crosses were given to each symptom. It is obvious that such a method of standardisation can only give a very rough measure of the severity and progress of the disease, but in a disease which has no more marked objective symptoms than these, it is only possible to adopt some such procedure. Further it was necessary to see a large number of patients in a morning, and no more detailed examination was possible.

To each patient was given a card, with the method of treatment written on it, and he was instructed to obtain weekly a fresh bottle of oil, which would be inscribed on the card by the dispenser. He was further to present himself to the doctor again in about a fortnight. At the next visit, the number of bottles of oil consumed by the patient were noted down by the doctor, but it was never found possible to compel the patients to fetch or send for their bottles at perfectly regular intervals. At each fresh visit to the doctor the patient was put through his paces, and the gait, stair-climbing capacity, and rib pressure pains were charted again with crosses. Most patients showed some improvement after a fortnight, and very marked progress in a month; if they failed to do so, the treatment was usually changed about the fourth or fifth week to cod-liver oil if they were receiving phosphor oil, or to larger doses of cod-liver oil if they were already receiving it. When patients began to improve, the improvement was almost always first manifest in the ribs, and often the ribs were no longer sensitive to pressure at a time when the gait had as yet scarcely shown any improvement. The sacral region and gait then gradually improved, until the walk and stair-climbing appeared normal; but long after all objective symptoms had vanished, the patient still complained of pains about the thighs and feet, particularly in the insteps. In comparing the time required to effect a cure with the three different treatments, it was decided to disregard such purely subjective symptoms; there was no means of standardising them, and although there is no doubt that they were often genuine, sometimes they may not have been, and the desire to continue to obtain a weekly bottle of oil and sick-pay benefit cannot be excluded. All oil, and particularly cod-liver oil, fetched a very high price in Vienna, and a patient almost cured might well wish to sell his weekly bottle. It is not thought that there was danger of such fraud earlier in the disease, for the patients were in great pain and misery; many of them would weep, and their eagerness for the oil was in some cases almost wolfish. In view of the considerations just stated, it was decided that in studying the rate of cure, the course of the disease after disappearance of objective symptoms should be neglected; the term "cure" is therefore used in this study to indicate the time at which all objective symptoms had vanished. It is not to be supposed that treatment ceased at this point.

An attempt was made to weigh patients every time they came up for examination, but it had to be abandoned. Time did not permit of each patient being stripped, and the change from winter to summer made it impossible for them to come always in the same clothes. The patients were all thin, as is, indeed, the entire poor population, but they were not especially emaciated. Enough information was obtained to show that no very considerable increase of weight accompanied the cure; patients showed perhaps 1 kilo, 1½ or 2 kilos gain over the whole period of two or three months. Of 24 cases who were weighed at the beginning of treatment, and again one to three months later, after a marked improvement in their symptoms had taken place, an average gain of 3·5 kilos is recorded, if a difference of about 3 kilos between the winter and summer clothing is allowed for. Thus it is clear that there was no tremendous regaining of weight, corresponding with the enormous losses some of the patients claimed to have suffered; one case, for example, Juliana B., claimed to have lost 30 kilos, another, Leopoldine G., 17 kilos, and a third, Rudolf N., 20 kilos. Neither did the patients appear much fatter after the cure had set in, although their appearance was much changed; the colour was much better, and the whole mien of the people altered; from being a waiting queue of the most pitiful human wreckage, scarcely able to creep along, ready to burst into tears at a word of questioning, they became a row of brisk individuals, cheerful and extremely grateful.

Analysis of the Results.

In analysing the figures, dealing with the rate of cure in the different treatment groups, a number of factors come into play which tend to destroy the greater accuracy which it was hoped to attain by

investigating a large number of cases. In the first place, a certain number of cases have to be rejected altogether, owing to complications with other diseases, irregularity of attendance and similar factors. Among those left, 130 in number, the effect of the interfering factors is to break up the three large groups planned for into a much larger number of smaller groups, groups so small that in many cases they cannot contain sufficient numbers to be representative.

One such factor is the initial severity of the cases; obviously in comparing the length of time necessary for all objective symptoms to vanish, very severe cases and very slight ones could not be taken as comparable. Cases were therefore broken up into four degrees of severity, according to the number of crosses given to the three objective symptoms, as already described; here was wide scope for human error. On working out from the patients' cards the average weekly dose of oil taken, it was found that the oil had been drawn so irregularly that patients fell into six groups, instead of the three planned—i.e., over 150, from 100 to 150, and under 100 g. weekly of cod-liver oil, and the same of phosphor oil. Since each treatment group contained four different degrees of severity of the cases, 24 groups were revealed instead of the three sanguinely hoped for. When 130 patients have to be divided among 24 groups instead of three, the result loses very much of the reliability that was hoped for from the use of large numbers.

Further possible sources of error were alterations in the patients' diet, either through the change of the season or through free gifts from relief organisations. The latter certainly took place to some extent, but was spasmodic, and did not appear sufficiently important to merit attention. The seasonal alteration in diet might have been a serious source of error, since the investigation was carried on from the end of February to the end of June. About mid-April patients began to report eating spinach twice a week, and by the end of May occasional eggs and a little meat were not infrequent. It is not, however, thought that this factor is an important one in influencing the cures in the present experiment, although it has been suggested as an important factor in determining the number of new cases reporting sick. Patients seldom report sick with osteomalacia until they have had it for several months and are getting steadily worse; to be no longer getting worse, though scarcely perceptibly better, would be enough to deter patients from reporting who had not reported already. The cures with cod-liver oil and large amounts of phosphor oil were, on the other hand, so comparatively rapid that the small added improvement which might be brought about by the consumption of spinach twice a week would be unimportant. Also in many cases cures were well on foot, and great progress had been made before any seasonal alteration in the available food could be detected. It is therefore believed that this factor can be neglected in the analysis of the figures.

The results show clearly that hunger-osteomalacia can be cured by administration of cod-liver oil, even in amounts of only 100 g. weekly, or of phosphor oil in larger quantities, about 200 g. weekly. Clearly the amounts of oil previously administered from the Krankenkasse had not been large enough nor regular enough, though they were probably as large as the smaller amounts of cod-liver oil administered in the experiment. All patients with one possible exception, a very old and refractory case, Max L., improved when treated with 200 g. of cod-liver oil weekly. All patients treated with phosphor oil did not improve in the same way, particularly those who by infrequent visits reduced their weekly average to less than 150 g. When patients after several weeks of treatment showed no or very little improvement, or actually got worse, as was occasionally the case with phosphor oil, the treatment was usually changed from phosphor oil to cod-liver oil or from smaller to larger amounts of cod-liver oil. In every case save one (Max L., phosphor oil 200 changed to cod-liver oil 200), where such a change was made, much better progress took place after the change.

Table I. has been constructed to show (1) the number and percentage of patients who improved on the various treatments; (2) the number who showed no improvement; (3) the number who had changed treatment, as just described; and (4) the result of the changed treatment. In analysing the figures in this way, where some degree of improvement is the criterion taken, cases of all degrees of severity are dealt with together, for although the severity influences the length of time needed to accomplish a cure, yet it does not appear to influence the length of time in which a material degree of improvement sets in. In Table I. the figures dealing with 130 patients are thus analysed, and it is seen that: (A) In Group I., containing two patients who received less than 100 g. phosphor oil weekly, neither (i.e., 0 per cent.) showed improvement, while in Group IV. 34 received the same amount of cod-liver oil, and 31 (i.e., 91 per cent.) showed good improvement; (B) in Group II. 10 received 100–150 g. of phosphor oil weekly, and 6 (i.e., 60 per cent.) showed progress, while in Group V. 34 received the same amount of cod-liver oil, and 32 (i.e., 94 per cent.) showed good progress; (C) in Group III. 29 patients received 150–200 g. of phosphor oil weekly, and 21 (i.e., 72 per cent.) showed good progress, while in Group VI. 21 patients received 150–200 g. weekly of cod-liver oil, and 21 (i.e., 100 per cent.) showed progress. The patients whose treatments were changed are not represented again in the groups for their second course of treatment. For instance, the one patient, Max L., who made no progress after being changed from 200 g. weekly of phosphor oil to 200 g. weekly of cod-liver oil, is mentioned only in the first-named group and not again in the second. The figures show that even 150–200 g. weekly of phosphor oil gives a percentage progress rate (72 per cent.) which falls below the rate (91 per cent.) for quantities of only 50–100 g. weekly of cod-liver oil, pretty clearly indicating that the healing effect must be due to something other than mere fat as fat or phosphorus. The percentage progress rates for the three cod-liver oil groups lie very close together—i.e., 91 per cent., 94 per cent., and 100 per cent.—showing that in most cases even 50–100 g. weekly of cod-liver oil is sufficient for cure.

TABLE I.—*Comparative Progress of Patients with Hunger-Osteomalacia Treated with Phosphor (Plant) Oil and Cod-Liver Oil.*

(A) Number of patients showing progress.
(B) Number of patients showing no progress. Treatment unchanged.
(C) Number of patients worse or showing no or very little progress. Treatment changed.
(D) Number of patients showing greater progress after change.
(E) Number of patients showing no progress after change.

Group.	Treatment.	Oil g. weekly.	Total patients.	(A)		(B)	(C)	(D)	(E)
				Total.	%				
I.	Phosphor oil	60–100	2	0	0	1	1	1	0
II.	,,	100–150	10	6	60	2	2	2	0
III.	,,	150–200	29	21	72	1	7	6	1
IV.	Cod-liver oil	50–100	34	31	91	0	3	3	0
V.	,,	100–150	34	32	94	0	2	2	0
VI.	,,	150–200	21	21	100	0	0	–	–

An attempt has been made in Table II. to compare the rate of cure on different treatments of patients whose treatment remained the same throughout. For this the patients needed to be as comparable as possible, and the group of patients of moderate severity (+) has therefore been chosen, because it contains the largest numbers. In

TABLE II.—*Comparative Rates of Cure of Cases of Moderate Severity (+), whose Treatment Remained Unchanged Throughout.*

Treatment.	Total No. of patients.		No. of weeks in which cure was completed (A), or after which treatment ceased, though cure still incomplete (B).												
			2	3	4	5	6	7	8	9	10	11	12	13	14
Phosphor oil, 100–150	2	(A)	0	–	–	–	–	–	–	–	–	–	–	–	–
		(B)	2	–	–	1	–	–	1	–	–	–	–	–	–
Phosphor oil, 150–200	12	(A)	9	1	–	2	1	3	1	–	–	1	–	–	–
		(B)	3	1	2	–	–	–	–	–	–	–	–	–	–
Cod-liver oil, 50–100	22	(A)	18	1	–	–	3	5	1	2	–	2	–	2	1	1
		(B)	4	1	–	–	–	2	–	1	–	–	–	–	–	–
Cod-liver oil, 100–150	17	(A)	17	–	1	2	3	2	3	3	–	2	–	–	1	–
		(B)	0	–	–	–	–	–	–	–	–	–	–	–	–	–
Cod-liver oil, 150–200	8	(A)	6	–	1	1	–	2	–	–	–	–	1	1	–	–
		(B)	2	–	1	–	–	–	–	–	–	–	1	–	–	–

each treatment group a certain number of cures were unfinished—that is to say, that although good progress was being made, all objective symptoms had not disappeared on the last occasion on which the patient was seen. These unfinished cures are represented in the table because they cannot fairly be entirely neglected, but they are left out of consideration because they are inconclusive. The table shows that in the five treatment groups represented the dates of "cure" ("cure" being used in the special sense already described p. 5) distribute themselves pretty equally from the second to the tenth week, with a few as late as the fourteenth week. There is certainly no great superiority in rate of cure in any one group over any other group. Such a table suggests that as soon as sufficient of the curative substance is supplied rate of cure is not appreciably hastened by more intensive treatment; probably the maximum rate of repair has been attained, but it is also possible that repair at an even more rapid rate may be only prevented by an insufficient supply of something else, the lack of which acts as a limiting factor.

The Possible Value of Phosphorus.

The work of Schabad (1909, 1910) on calcium retention in the cure of rickets by treatment with oils suggests that an insufficient supply of phosphorus may have been such a limiting factor. He found that cod-liver oil had great power in increasing calcium retention in rickets and that this power is further heightened on addition of phosphorus to the cod-liver oil. If, then, there is a parallel between hunger-osteomalacia and rickets, it is possible that addition of phosphorus to cod-liver oil might also hasten the cure of osteomalacia. It is unfortunate that in our experiments the vegetable oil had an addition of phosphorus while the cod-liver oil had not; had the cod-liver oil also contained phosphorus it is possible that its superiority over the vegetable oil might have been even more marked. Schabad also found that certain vegetable oils had power to increase calcium retention in rickets, but in the case of sesamum oil this was not so, and addition of phosphorus to the inactive oil failed to awake any activity in it. His work, therefore, makes it clear that the coöperation of another factor in the oil is required and that the absence of such a factor may entirely limit any curative power of the phosphorus.

From the present experiments it would therefore seem that in the treatment of hunger-osteomalacia a dose of about 100 g. weekly of cod-liver oil is the most economical form of therapy to commence with in all cases, increasing the amount later only in those refractory cases which make little or no progress upon this dose. From the present experiments no conclusion can be drawn as to the possible coöperative value of phosphorus. Reference to one particular case is made in more detail; it is a particularly striking one but is also characteristic of a large number in which the result of treatment with cod-liver oil stands out in contrast with that of the former routine Krankenkasse treatment with phosphor oil.

The patient, Wilhelmine O., gave a history of having been ill for 30 months; for nine months, March, 1919, to January, 1920, she had been receiving the routine Krankenkasse treatment with phosphor oil, which left her condition unchanged. When first seen at the beginning of March, 1920, she was unable to dress or undress herself, and could not even turn her head without pain. She showed a rapid improvement on cod-liver oil, 125 g. weekly, and by the first week in June—i.e., after three months of treatment—described herself as "Vollständig gut," save for a slight pain in the lumbar region. Thus all objective symptoms and almost all subjective ones also, of an illness lasting 30 months, were dissipated in three months by rather more than one tablespoonful of cod-liver oil daily. This patient had been known to one of the writers (E. N.) for the whole 12 months during which she had attended at the Krankenkasse, and the unaltered condition during the nine months of phosphor oil treatment, followed by the cure on three months cod-liver oil, was most impressive.

When patients were considered to be cured the treatment was discontinued, and as far as it was possible to judge in the time, relapse did not tend to take place. Treatment was in no case stopped till May or June and the experiment was terminated at the end of June. Patients when sent away were instructed to come back at once if they felt worse, and of over 70 patients so discharged only three or four had returned announcing a relapse; in these cases the relapse only consisted in a reported return of subjective symptoms which may or may not have been truly stated. It seemed most probable that the patients would remain in health through the summer but would relapse again towards the end of the year unless treatment were resumed or the food obtainable in the winter became better.

Effect of Treatment on Cases of Rachitis Tarda.

Of the 10 cases of rachitis tarda encountered, 4 cases (2 boys and 2 girls) were chosen out for in-patient treatment and will be described in a later communication. The other 6 were all boys, one 16, one 17, one 18, two 19, and one 20 years of age. Three dosed with 200 g. of cod-liver oil weekly, and one dosed with 100 g., made excellent steady though slow progress; two dosed with 200 g. weekly of phosphor oil, but very irregularly taken, made little or no progress.

Bearing of the Results on the Ætiology of the Disease.

As far as the present mass experiment throws light on the ætiology of hunger-osteomalacia, it seems to support the hypothesis that the disease is due to a deficiency of the fat-soluble accessory factor. The disease was cured, and dramatically cured, by an addition of fat only to the diet. It is true that the plant oil contained phosphorus, but the cod-liver oil had no such addition, though it may itself have contained phosphorus to some extent. It has already been suggested that the absence of phosphorus in the cod-liver oil may have acted to some extent as a limiting factor, but there is no evidence that the rate of cure bore any relation to the amount of phosphorus administered. There is evidence, on the other hand, that the cod-liver oil cured in quantities in which the plant oil did not, and that bad or obstinate cases yielded to cod-liver oil when they would not do so to plant oil. This evidence seems good enough to exclude fat as fat and to point to some other property, possessed in greater measure by cod-liver oil, as the curative agent. One such property cod-liver oil is known to possess in its rich content of the fat-soluble A accessory factor.

The difference between the winter and summer diet of the population and the corresponding seasonal alteration in the severity and prevalence of the disease yields another interesting piece of evidence, connecting the disease with a deficiency of the fat-soluble A factor. The winter diet of the poorest of the Vienna population is chiefly bread, "Kraut," and root vegetables, while the summer diet is principally enriched by the addition of green vegetables and salads. The kraut used in winter is the white hearts of cabbages, which are stripped of their green leaves in the autumn and are then stored in the same way as root vegetables. Unpublished experiments at the Lister Institute, on guinea-pigs, have shown that while green cabbage is growth-promoting even in small amounts, white cabbage in much larger amounts is not so; for instance, 5 g. of raw green cabbage, when added to a diet deficient in the fat-soluble A factor produces good, though not fully normal, growth in guinea-pigs, while 15 g. of white cabbage added to the same diet produces no growth at all. A similar observation for other etiolated shoots has been made by Drummond and Coward (verbal communication), using young rats. The white leaves are, however, not deficient in the anti-scorbutic factor (Delf, unpublished experiments). The bread and root vegetables which make up the remainder of the diet of the poor have been shown again and again, with the exception of carrots, by McCollum and his co-workers to be deficient in the fat-soluble accessory factor.

More evidence is needed in order to clear up completely the question of the ætiology of this disease, and it is possible that in the deplorable event of the

same conditions prevailing in Vienna during another winter such evidence may be obtained. The ætiology of hunger-osteomalacia has not only the interest that it is the ætiology of a new disease, but it has also great importance from its relation to rickets through rachitis tarda and from the light which a knowledge of its ætiology may throw upon the ætiology of rickets. Whether it is the same disease as the already well-known osteomalacia of pregnancy appears very uncertain. Among the Krankenkasse cases only one, Marie L., was encountered that had any claim to be diagnosed as osteomalacia of pregnancy. This case was that of a woman beyond the child-bearing age, who, however, gave a history of osteomalacia during pregnancy going back to 14 years before; several of her children had suffered from severe rickets. If pregnancy-osteomalacia and hunger-osteomalacia are the same disease it is hard to understand why the former has not greatly increased in Vienna, but it has not done so. It cannot be that such cases were wholly overlooked; it may be that economic conditions do not on the whole press so severely on young women of the child-bearing age, who would in most cases have a husband to support them, but unless some such factor is operative it can scarcely be that hunger- and pregnancy-osteomalacia have the same ætiology.

Summary.

1. 177 cases of hunger-osteomalacia were treated as out-patients in Vienna. Of these, only 130 entered into the final analysis of the experiment.

2. About one-third of the number was treated with a plant oil (subsequently identified as belonging to the rape oil group) containing phosphorus, the other two-thirds with cod-liver oil.

3. Most of the patients made progress, but some of the patients on plant oil had to be transferred to cod-liver oil, and some of those on cod-liver oil had to have the dose increased before good progress could be made.

4. The results fall into a series; doses of about 100 c.cm., 150 c.cm., and 200 c.cm. of each of the two kinds of oil were given. The smallest doses of plant oil gave the worst result and the largest doses of cod-liver oil the best; the smallest dose of cod-liver oil was better than the largest dose of plant oil.

5. Once a good improvement was set on foot it could not be detected that the rate of progress on the different doses varied much.

6. It is provisionally concluded that cure of the disease was due to addition of vitamin A rather than of fat as fat to the diet.

7. The relation of hunger-osteomalacia to the osteomalacia of pregnancy is regarded as quite uncertain.

The expenses of this research were defrayed by the Medical Research Council.

Appendix.

A sample of the phosphor oil used in the above test was submitted to Dr. J. C. Drummond at University College, London, who reported that he had little hesitation in placing it in the rape oil group; in fact, he adds: "It is probably true rape oil itself. It appears to be fairly crude, since there is a considerable deposit of recognisable plant debris." The oil was also tested by Dr. Drummond on rats for its value in vitamin A. It appeared to be almost, if not wholly, incapable of restoring growth in rats which had declined on a diet deficient in vitamin A, in the quantities of it able to be consumed by rats; such quantities are, however, necessarily small. The authors are much indebted to Dr. Drummond for undertaking this examination for them.

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PRACTICAL POINTS IN THE TREATMENT OF PLAGUE.[1]

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THE beginning of pneumonic plague of 1920–21 was quite insidious. As in the outbreak of ten years ago, it began in the Transbaikal district of Siberia towards the end of summer, when a Russian family, consisting of one woman, her son, and two daughters, were reported to have been attacked by the disease in its bubonic form. With the exception of the man, treated at Manchouli Hospital, all died. Then two Cossack soldiers living in the same compound took the infection and died, the last on Sept. 20th. After this no more was heard until October, when the wife of a Russian guardsman, in charge of the railway bridge at Hailar, died of bubonic plague. She infected three out of five sons, who all died; also her husband, who recovered. These cases were seen by me at the Railway Hospital and were purely bubonic. Three Chinese soldiers living in the same compound also died of the disease. Owing to the free intercourse between the sick and some outside workmen, the infection was distributed in the city, and our efforts at segregation met with only partial success. During our stay at Hailar we could trace the gradual evolution of the plague from bubonic, through the septicæmic into the pneumonic form, after which it became most infectious and dangerous. One day the local chief of police was attacked by the soldiers, and nine men under observation were set free by the soldiers. Some later deaths at Hailar were traced to those who escaped, but two reached the coal-mines of Dalainor (100 miles away) and spread the infection broadcast among the coolies living in the semi-underground huts of that place. Manchouli was reinfected from Dalainor, and in its turn sent infected persons by rail to Tsitsikar, and later on to Harbin. In this way the whole line, from Manchouli to Vladivostock (1072 miles) and from Harbin to Changchun (150 miles), received the infection in a greater or less degree. Fortunately, however, owing to the early preparations made by the Manchurian Plague Prevention Service and to the splendid coöperation displayed by the authorities of the Chinese Eastern, South Manchurian and Chinese Government Railways, as well as by most classes of people from Governor-General Chang Tso Lin downwards, the epidemic did not reach the colossal dimensions of that of 1910–11. Possible cases were rigidly controlled, and the passenger traffic between Manchouli and Harbin was stopped from Feb. 1st. Third-class traffic from Harbin to Changchun was limited to only 150 persons, who, after inspection at Harbin, had to undergo quarantine for a further period of five days at Changchun. In this way, although the number of deaths at Harbin was considerable, comparatively few cases occurred south of this city. For instance, the whole of Changchun district only claimed 77 deaths from plague, and Mukden only 4 deaths, as compared with 5000 deaths in each city during the epidemic of ten years ago. The population of Manchuria had increased from 12 millions to 22 millions, while that of Harbin had jumped from 70,000 to 300,000 during the intervening ten years. Whereas at least 50,000 plague deaths were recorded in 1910–11, only 8500 persons died in the epidemic of 1920–21. These are satisfactory figures and show what modern prevention may accomplish against dangerous disease. It is hoped that our people may take this lesson to heart, and in future have more faith in their scientific men, for in the fight against such insidious and unseen foes as plague germs, only those experts who are specially trained can keep their presence of mind and at the same time perform their duties effectively and economically.

[1] A preliminary report on the second Manchurian plague epidemic, 1920–21.

Statistics.

As said above, the last epidemic started in Siberia, but later on, when the cases at Manchouli were many, especially among the Russians, certain towns in Siberia were reinfected by escaping refugees. In Manchuria proper the following table shows the places infected from west to east, together with the first cases reported, and total number of deaths.

Places Infected with Plague from West to East.

Town.	First cases recorded.	Total deaths.
Manchouli	Sept. 7	1141 (R. 334 : Jan. 1)
Dalainor	Jan. 13	1017 (R. 4)
Hailar	Oct. 22	98 (R. 27)
Mentuho	Jan. 30	4
Buketu	Feb. 3	25
Ananchi	Feb. 3	84
Tsitsikar Station	Jan. 27	88
Tsitsikar City	Jan. 18	1734
Fulardi	Feb. 10	48 (R. 3)
Anta	Mar. 19	25
Tuichingsan	Mar. 5	28
Harbin District	Jan. 22	3125 (R. 8 : Jan. 3)
Hulan	Feb. 7	322
Asheho	Feb. 12	123
Imiampo	Mar. 15	35 (R. 1)
Hantaoho Tzu	Mar. 27	16
Hailin	Mar. 8	7
Shihtaoho Tzu	Mar. 25	19
Suifenho	Mar. 14	12 (R. 2)
Shwangchengpu	Mar. 14	134
Yaomen	Feb. 3	21 (R. 1)
Changchun District	Jan. 31	77
Yu Shu	Mar. 8	153
Mukden	Mar. 29	4
Koupangtzu District	Mar. 27	18
Other cities	—	150
Total for Manchuria		8508

These figures include 380 Russians and 4 Japanese. Other places infected besides Manchuria were :—

Vladivostock and Ussuri	April 9	520 (R. 40)
Sangyuan dist. (Chihli Province)	Feb. 24	200
Chefoo and Shantung	May 3*	80
Total		800

* By steamer.

Seven infected rats were discovered at Vladivostock as well as human bubonic cases.

We made and distributed 60,000 anti-plague gauze masks and 8000 doses of anti-plague vaccine from our laboratory. In addition to our routine work, our staff took advantage of the occurrence of this rare epidemic to perform a series of important bacteriological investigations.

The following are some of the findings obtained as a result of investigations made during the epidemic.

1. *How did the pneumonic plague originate?*—It may be remembered that early in September, 1920, some cases of bubonic plague were reported at Abagatui and other Siberian towns close to the Manchurian border. One patient reached Manchouli Hospital and was cured. In October a few more cases were reported from Hailar. I reached that city on the last day of October and saw the gradual merging of the bubonic into the septicæmic and later into the pneumonic form. As it was difficult to catch fleas in dark dirty rooms through dull paper-covered windows, we utilised guinea-pigs by allowing them to roam about the rooms, hoping that the fleas would attack them and thus get caught. But in this we were unsuccessful. Fly-papers were also used with no avail. Once the plague became pneumonic its spread was rapid, as being a direct infection from man to man, it followed the lines of human travel. Even the cancellation of passenger traffic on the railways only limited the number of infections, not the extent.

2. *Wherein does the real danger of the plague lie?*—This danger lies, in my opinion, in the neighbourhood of a patient in whom cough and the accompanying bacilli are already present. Infection is carried in droplet form—that is, when the moist sputum is thrown out during talking or spitting. Experiments performed in Mukden ten years ago and repeated this time at Harbin show that, under ordinary circumstances, these droplets seldom travel more than three feet. In crowded inns, with closed windows and no ventilation, infection naturally spreads rapidly, particularly at night-time when the coolies are huddled together. If a way can be found to allow persons to sleep as well as work out in the open air, however cold, infection will not take place and pneumonic plague will lose its dreadful character.

3. *Is the cotton and gauze mask efficacious against plague?*—If properly worn it is certainly efficacious. No antiseptics or strong-smelling chemicals are necessary. Masks act as filters, and the plague germ cannot pass though dry cotton-wool. When our Dr. Yuan Teh Mao died on Feb. 20th we were afraid that if the mask became moist as a result of continued breathing the germs might get attached to the wool and inhaled. We experimented with several masks from doctors and attendants which had been worn for half to four hours at a time. Cultivations were taken from the outer, middle, and inner layers of the cotton-wool. Out of 15 cultivations so made, only one—the outer covering of a mask worn for three hours—showed the plague bacilli. Nevertheless, we considered it best for those in immediate contact with patients to wear, in addition to the mask, a head-covering made of cloth with an extra piece of silk in front of the nose and mouth.

4. *Is the air of the sick room infectious?*—To prove this we allowed a series of guinea-pigs and rabbits kept in tin buckets to stay in the rooms occupied by the sick and the dead for periods varying from half an hour to three days. Up to date seven such experiments have been performed, including one at Dalainor, and 52 animals have been used. Only four animals died, and these mostly young ones, thus showing that the air of sick rooms by itself is not so dangerous as might have been expected.

5. *Why did so many burial coolies die in this and the previous epidemic?*—Usually these men were not in contact with sick persons. We suspected from the number of corpses, from whom the clothes had been removed, that perhaps these clothes might be a factor in the dissemination of the disease. We therefore cut out pieces of the clothes from in front and behind and made the necessary cultivations. Out of 22 pieces thus examined 16 were found to be infectious, thus proving that the clothes from plague victims were highly dangerous and should be burnt with the dead bodies.

6. *What action does the best known antiseptics have on plague sputum?*—We used carbolic acid, lysol, sublimate, permanganate of potash, hydrogen peroxide, alcohol, methylated spirit, and cresol, and similar milky disinfectants. Over 400 experiments were performed in this connexion. Dealers in these commodities will be surprised to learn that plague sputum is extremely resistant to their action, and more concentrated solutions for longer periods than usually recommended are necessary to destroy the bacilli.

7. *What is the best way of disinfecting plague houses?*—Our routine method of disinfection during this epidemic has been to fumigate the houses with moist sulphur gas by burning the crude sulphur in an earthen pot after the walls and floor have been sprayed with water. The floor containing the sputum is covered with slaked lime. Our doctors' clothes and overalls are fumigated with formalin gas made from 100 g. of permanganate of potash, 100 g. of hot water, and 200 g. of formalin warmed in a pot.

Fuller details of the epidemic will be furnished at the opening of the Rockefeller College, Peking, and at the Conference of Japanese Doctors at Port Arthur, while a full scientific report will appear next spring.

DONATIONS AND BEQUESTS.—The board of management of the Royal Infirmary, Manchester, have received legacies of £3000 from the late Dr. Lloyd Roberts, also £500 for a lectureship; £1000 from the late Mr. W. Sutcliffe; also £550 from the Queen Alexandra Flower Carnival, and £315 from other sources. Henshaw's Blind Asylum, Manchester, has received £1000 under the will of the late Mr. James Booth, of Didsbury; £200 from the late Mr. Joseph Core; also completion of transfer of £5340 war stock from the executors of the late Mr. Jesse Howarth. St. Mary's Hospital, Manchester, has received from the executors of the late Dr. Lloyd Roberts £5000 and £500 for a "Lloyd Roberts Lecture," £1000 from the late Margaret Ambler, £1000 from the late Mr. W. Sutcliffe, and £177 from the Queen Alexandra Flower Carnival.—The Maharajah Holkar of Indore has sent a donation of £500 to the Mental After-Care Association, Church House, Westminster, towards the expenses of dealing with patients who have suffered from nervous or mental trouble caused directly by war service.—The late Charlotte Susan Chalmers, of Aberdeen, left the following legacies: Morningfield Hospital for Incurables, Aberdeen, and Aberdeen Royal Infirmary, each £250; Royal Aberdeen Hospital for Sick Children, £100; Royal Hospital for Incurables, Putney, £10.

Medical Societies.

ROYAL SOCIETY OF MEDICINE.

CLINICAL SECTION.

EXHIBITION OF CASES AND SPECIMENS.

A MEETING of this section of the Royal Society of Medicine was held on Oct. 14th with Sir W. HALE-WHITE, the President, in the chair.

Dr. H. L. TIDY showed a case of

Diabetes Insipidus

following a bayonet wound under the left eye. The patient stated that on recovering consciousness after his wound his first sensation was thirst, and he had noticed constant thirst and polyuria ever since. It was supposed that the wound had involved the pituitary gland, but it had healed without any other complication than that for which the patient was exhibited. The patient's sugar tolerance was well up to normal, and the Wassermann reaction was negative. Various forms of treatment, including pituitary extract, had been tried without any success. Temporary improvement had followed restriction of fluids, but the patient could not tolerate this treatment.

Dr. A. FEILING inquired whether valerian had been exhibited, and Dr. TIDY replied in the negative.

Dr. FEILING and Mr. W. L. HOLYOAK showed a case of

Renal Dwarfism

in a boy, aged 12½ years, who came under observation for defective vision in the left eye. His height was 43½ in., weight 3 st. 13½ lb.; and his mental state appeared normal. The legs exhibited marked genu valgum, and both this and the defective vision were said to have come on after an attack of whooping cough at the age of 4. In the left eye vision was reduced to large moving objects only, and there was primary optic atrophy. Vision in the right eye and the visual field were normal. There has been constant albuminuria amounting to 0·25 per cent. with a few hyaline and granular casts. The cardio-vascular system was normal, and the blood pressure not raised. The Wassermann reaction was negative in both blood and cerebro-spinal fluid. An X ray of the skull showed an undeveloped sella turcica. Dr. Feiling asked for advice as to treatment of the genu valgum.

Dr. TIDY inquired whether there was a history of similar conditions in other members of the family. The answer was in the negative.—Mr. R. P. ROWLANDS said he would be adverse to any operation for the genu valgum.—Dr. F. PARKES WEBER saw no reason to connect the optic atrophy with renal disease in this case.

Dr. G. A. BACK showed a case of

Doubtful Cyst of the Left Lung for Diagnosis.

The patient, a railwayman, aged 39 years, was attacked with a sharp pain in the left side of the chest on August 15th, 1921. He continued at work for three days, and then saw a doctor as the pain persisted and he had some cough with colourless expectoration. He came to St. Thomas's Hospital on Sept. 7th, when he presented the following physical signs: dullness, much diminished breath sounds, and absence of vocal resonance and fremitus from first to fifth intercostal spaces on the left side. An X ray showed an opacity of the upper third of the left lung suggesting thickened pleura, and slight deficiency in expansion. The heart was not displaced, and there was no alteration in the voice or pupillary reactions. A blood count revealed a leucocytosis of 22,000 with 85 per cent. of polymorphs and no eosinophilia. Exploratory puncture had been performed without obtaining any fluid. He now had no expectoration and was not losing weight. Dr. Back discussed the differential diagnosis, which rested between encysted fluid or pus, hydatid cyst, or a growth.

Dr. MAURICE A. CASSIDY thought that aspiration with an ordinary serum needle was always unsatisfactory, and advised a further attempt with the largest needle obtainable, or an exploratory thoracotomy.—Dr. E. STOLKIND suggested an artificial pneumothorax and pleuroscopy as a means of establishing a diagnosis.—The PRESIDENT thought that all the signs pointed to a localised empyema probably following ambulatory pneumonia. The nature of the patient's pain suggested this.—Dr. BACK, in reply, said that in his opinion the sudden onset of the pain did not preclude a tumour, since the pain might coincide with the invasion of the pleura by a growth previously confined to the lung.

Dr. BACK also showed a case of

Chronic Pleural Effusion.

The patient, a commercial traveller, aged 41, began to suffer from a dull aching pain in the left hypochondrium and lumbar region in August, 1920. In December, 1920, he was admitted to the London Hospital, where he was X rayed for a renal calculus with a negative result. Shortly after 4 oz. of fluid were aspirated from the left pleural cavity. No tubercle bacilli were found in the fluid. He was sent to Felixstowe to convalesce, but the pain continued. In March, 1921, he was admitted to the Homœopathic Hospital, where he remained for nine weeks and the left chest was aspirated on two occasions. On the first occasion 30 oz. of clear fluid were withdrawn, and on the second occasion a similar quantity of blood-stained fluid. He said the pain was no better on discharge, and that he had some difficulty in breathing. In July, 1921, he had once a slight hæmoptysis and on July 30th he was admitted to St. Thomas's Hospital with a temperature of 102° F., when he presented all the signs of a left-sided pleural effusion up to the third rib. During three months in hospital the pain had not improved, but the temperature had only been above normal on three or four occasions. He was aspirated on two occasions, and the fluid obtained was deeply blood-stained. Some of the fluid had been injected into a guinea-pig, in which no tubercles were found after death. His weight had remained unaltered at 8 st. 2 lb. Dr. Back asked for opinions as to diagnosis.

The PRESIDENT thought that the presence of blood on no less than three occasions in the fluid was strongly suggestive of a new growth.—Dr. STOLKIND thought that in this case also artificial pneumothorax, followed by pleuroscopy, would assist in diagnosis.

SOCIETY OF MEDICAL OFFICERS OF HEALTH:

NAVY, ARMY, AND R.A.F. HYGIENE GROUP.

THE annual general meeting of this group of the Society was held at 1, Upper Montague-street, Russell-square, London, on Sept. 30th, when Surg. Rear-Admiral Sir PERCY BASSETT-SMITH was unanimously elected President of the Group for the ensuing year.

Major-General Sir W. G. MACPHERSON read a paper on

Disposal of Latrine Contents with Special Reference to Immediate Incineration.

He said that the subject was of interest in civil life in connexion with holiday and other camps. The prejudice against the system of immediate or individual incineration was due to ignorance of its advantages. He did not propose to discuss recognised water-carriage systems, nor to detail the different kinds of camp latrines and incinerators, but only to review these briefly in discussing the special differences between immediate incineration and indirect methods of disposal. Sir W. Macpherson described the appalling conditions produced by prolonged use of the shallow and deep trench systems, unless under constant and careful supervision. War experience had shown that wherever possible the most satisfactory method of disposal was by incineration. There were two recognised methods of disposal by incineration: in one the latrine contents were carried in buckets or filth carts to incinerators at some distance from the latrines, and in the other

the excreta were disposed of immediately after defæcation in an incinerator placed in or near the latrine. The danger of fly infection and the labour required for removal of the necessary buckets and their cleansing were disadvantages of the first method. A point in its favour was that "fæcal urine" was not so excessive as to prevent the whole bucket contents being disposed of in incinerators of good construction, provided these were kept supplied with sufficient fuel. In dealing with the second method, he gave details of an experiment made by the Germans at Potsdam in 1902, where the latrine seats were placed over hoppers which led direct on to iron plates and pans inside a furnace, the furnace being only lighted twice a week. The abandonment of this system was attributed to the smell, but a trial with only a bi-weekly incineration could not be considered a fair one. The McCall system, started by the Americans during the Cuban war, had been abandoned owing to expense of iron plates and fuel. Sir W. Macpherson said he had had personal experience of the method of direct incineration before the war, both in India, and Aldershot, and here the simple device of placing a layer of bhoosa or other dry material on the ground, making the men defæcate on this and then set fire to it, proved extraordinarily satisfactory. More recently, in 1915, in France and also later in Salonika, he had started a method of immediate incineration, described in the *R.A.M.C. Journal* in 1915. The essential principles were, firstly, the disposal of the urine by the men themselves, either by emptying the receptacle into absorption pits, or by passing urine into a channel leading to the pit. Secondly, the deposition of excreta into the incinerator immediately after the act of defæcation, also by the men themselves. The incinerator could be of the open or closed variety, and was frequently made out of a cresol drum, placed in or quite near the latrine. This method proved entirely successful; there was an abundance of paper on to which the men could defæcate, and the fire in the incinerator when once started by some wood or hot ashes from the cook-house was kept at a red heat by the paper and fæcal matter deposited therein. A sergeant-major of a medical unit which adopted this system in France from 1915 to the end of the war maintained that it had the following advantages: (*a*) Cleanliness, freedom from flies, and comparatively little odour; (*b*) definite area only involved and practically no soiling of the ground; (*c*) only one sanitary attendant required; (*d*) it could be placed at a convenient distance from the men's living quarters without fear of offence; (*e*) it could be constructed with materials usually available in any camp by any intelligent N.C.O. within three or four days of arrival at the permanent camping site. In conclusion Sir W. Macpherson referred to the disposal of urine by means of absorption pits. The system was in use in India before the war, and was suitable for practically any form of soil, and he gave an instance of a field ambulance in Salonika where such a pit had been made in rock so dense that "blasting" had to be resorted to for its construction, and even this had worked satisfactorily. He therefore considered that the disposal of urine was a simple matter, and there was no difficulty in arranging, where necessary, latrine receptacles by which urine was separated from the fæcal matter so as to allow of immediate incineration being carried out.

Discussion and Reply.

Lieut.-General Sir JOHN GOODWIN said that any method of disposal should be as, far as possible, fool-proof. The method of immediate incineration was ideal, and should be taught and tried in Church Lads Brigade and other camps. The difficulties in future wars would be overcome if the civilian population were instructed in its use in peace-time.—Surg. Rear-Admiral Sir PERCY BASSETT-SMITH also considered the system advocated excellent, his only doubt being whether the disposal of the urine was entirely free from risk.—Lieut.-Colonel TILBURY BROWN gave his experiences in West Africa, where the natives would incinerate their own excreta but not that of anyone else. He thought the suggested method most valuable.—Lieut.-Colonel W. BUTLER considered incineration the most sanitary and satisfactory method, and emphasised the danger of fly breeding in deep latrines. His only objections to incineration were (1) loss of manurial value, (2) occasional incomplete combustion.—Lieut.-Colonel JOHN ROBERTSON said that he approved of the dry-earth system best where water-carriage was not available, but if the system described could be adopted in territorial or civilian camps it might prove satisfactory. He suggested that wet weather might hinder incineration, and that the smell might be a nuisance.—Lieut.-Colonel E. P. SEWELL regretted that the system of immediate incineration was not known in Palestine during the war. He instanced the equipment of latrine buckets and portable incinerator carried by camel during the Palestine campaign. Frequently the equipment had to be left on the wayside for lack of transport. Lines were soon fouled by trenches, but properly constructed cesspits were sometimes of value.—Group Captain DAVID MUNRO spoke of his experiences at Basra, where the method suggested might have succeeded admirably. Deep pits outside Basra City had been of use in disposing of latrine contents.—Surg. Commander R. J. MACKEOWN spoke of the difficulty of instructing the men. He asked what method the Japanese adopted in their war in Manchuria.—Lieut.-Colonel H. R. KENWOOD thought that water-carriage was always the best and cheapest method in the long run. The dry-earth system he considered next best; it caused no odour and no flies. Incineration was valuable and useful, but he knew that in some instances this method had had to be abandoned on account of the smell; probably the system of individual incineration would cause little or no nuisance in this respect. The disposal of urine was a difficulty, and a soakaway was not always suitable.

Sir W. MACPHERSON, in reply, said that he considered the method of immediate incineration to be fool-proof; in the emptying of urine receptacles into the absorption pit the men ran no more risk than any housemaid. As to the loss of manurial value, the ash from the incinerators was of considerable use as a fertiliser. Rain had no effect on the incinerator, but, of course, the latter could be covered if desired. There was little smell in the individual method, and two small cresol drums made into incinerators had in a C.C.S. in France dealt daily with the excreta from 2000 men. There was no difficulty in instructing the men; written instructions were posted up in the latrines. In Manchuria the Japanese used deep trench latrines. He agreed that the dry earth method was good, but it was inapplicable "in the field"; obviously no single method would be suitable for general adoption.

ROYAL MEDICO-CHIRURGICAL SOCIETY OF GLASGOW.

THE first meeting of the session was held on Oct. 7th, when Dr. G. B. FLEMING read a paper on

The Post-natal Treatment of Congenital Syphilis.

After briefly outlining the methods and results of treatment by mercury and arsenic in various forms, he explained the methods adopted at the Royal Hospital for Sick Children, Glasgow, for injecting the salvarsan substances. The criterion of cure adopted was a negative W.R. which remained negative. Seventy-four cases treated between 1917 and 1920 had been analysed and 35 cases had been followed up for longer or shorter times after treatment. Of 47 children under 1 year, 44 had negative W.R. at the end of treatment and 15 out of 21 were still negative after six months. Of 27 children over a year old, 20 were negative at the end of treatment and eight out of 14 tested were still negative after six months

The facts seemed to show that intravenous injection of salvarsan reinforced by mercury was the best post-natal way of treating congenital syphilis; that the younger the patient the greater the probability of cure; and that a case should only be pronounced cured when the Wassermann reaction has been proved to remain negative.

Dr. ETHEL CRAWFORD read a paper on Sulfarsenol in Congenital Syphilis.[1]

Prof. C. H. BROWNING made a communication on

The Anti-Syphilitic Action of Arsenical Compounds in relation to their Constitution.

He said that although there were many substitutes they were similar in chemical constitution to salvarsan, although there was an unfortunate diversity of names. Though atoxyl, which is a stage in the synthesis of salvarsan, has a serious effect on the optic nerve, there was no ground for the belief held by some ophthalmologists and others that salvarsan has a harmful action on the nervous system. Atoxyl bore a relation to salvarsan that might be compared to the relationship of alcohol to sugar. There was, however, danger in allowing solutions to remain exposed to air for long, as the solutions underwent decomposition; and there was also some danger from using large quantities of fluid at one time. Nowadays improved methods of administration and improvements in the drug itself had eliminated these risks. Salvarsan substances were not clearly defined chemical entities. They were colloidal substances, incapable of absolute purification, and consequently impurities appeared in the various preparations. These modified solubility, reaction after administration, &c., and might possibly modify the toxicity of the drug in the body. Thus it was impossible to test the activity of any of the salvarsan substances in vitro. The tests should be conducted in vivo by a disinterested party. The relative efficiency of the members of the group was important. The new substances were more easily given than the old, but, on the whole, less efficacious. In order to avoid danger the least toxic substance was usually employed, even though by reducing toxicity the therapeutic efficiency was also reduced. Old salvarsan produced a febrile reaction. When years ago an inquiry was made into the history of syphilitics in the Austrian army it was found that those who had developed a febrile reaction after infection did not develop general paralysis. To check the efficiency of treatment by the disappearance of clinical symptoms was not sufficient; biological tests such as the W.R. and the precipitation tests should be used.

Dr. J. R. C. GREENLEES read a paper on

The Ante-natal Treatment of Congenital Syphilis.

He said that post-natal treatment of congenital syphilis attacked the disease too late. The focus of the infecting spirochætes was probably the placental tissue and therefore treatment should aim at prevention of their development there and their spread to the fœtus. Dr. Greenlees quoted statistics to show that ante-natal treatment with mercury and iodide of potassium had not been very successful. On the other hand, 15 cases treated in the Royal Hospital for Sick Children, Glasgow, where ante-natal treatment was carried out with arsenical compounds and mercury, all showed successful results, some of these cases being followed up for as long as seven years.

Dr. LEONARD FINDLAY made a communication on

The Ravages of Congenital Syphilis: How to Combat them: A Plea for Notification.

He said that the foregoing communications showed that ante-natal treatment was *the* treatment par excellence. Prophylactic was beyond question better than curative treatment. The ease of the ante-natal method of treatment and the avoidance of the pain and misery many young syphilitics underwent in the course of the curative treatment were striking recommendations in its favour. Dr. Findlay criticised statements recently made to the effect that congenital syphilis was becoming less severe in its manifestations. He strongly advocated the application of the ante-natal method of treatment by the general practitioner, and gave his opinion that with the Wassermann test available and easy administration of the new salvarsan preparations there was no necessity for the special venereal clinic nor for the so-called venereal specialist in the case of syphilis. In conclusion he dwelt at length on the desirability of making syphilis a notifiable disease with particular regard to its influence on infantile mortality.

[1] See THE LANCET, Oct. 1st, p. 700.

WEST LONDON MEDICO-CHIRURGICAL SOCIETY.

THE opening meeting of the fortieth session of this Society was held at the West London Hospital on Oct. 7th, when Sir GEORGE LENTHAL CHEATLE delivered as his presidential address—

A Study of Breast Cancer in Relation to the Cancer Problem.

He said he had always been deeply impressed with the fact that any sufficient stimulus—mechanical or chemical—will cause the egg to awake and divide. If the stimulus was a living one it was probably of a physico-chemical nature. There were many factors influencing cell division—e.g., age, sex, heredity, &c. He particularly emphasised the importance of life-wear and nerve influence on the epithelial cells in this connexion. He did not consider that corset-pressure was an important factor in breast cancer. The traumatic mastitis that might result rapidly disappeared on removing the cause. But he showed how a diffuse, benign, desquamative hyperplasia of epithelium induced cyst formation in ducts and acini, or in ducts alone and acini alone. He believed the cause of the hyperplasia to be due to an irritant within the ducts or acini respectively. The irritant might enter the breast by the open orifices of the ducts on the surface of the nipple. He did not believe that the inflammation sometimes seen outside the ducts was the cause of the hyperplasia within. This was, in many cases, secondary and due to the irritant leaking out here and there, and causing isolated collections of lymphocytes.

The formation of cysts meant stagnation of contents, and as they caused irritation their action may remain undisturbed over long periods. Hence, two possible events might occur: (1) The formation of uni- and multi-radicular papillomata (simple); (2) the development of definite cancer (papillomatous or "laciform"). All of these he described as beginning in duct cysts, and in more than one part in the same breast. The multi-radicular papillomata were often malignant, and for this reason were the more important. The ampullæ of the ducts were a favourite site for their growth. The "laciform" type of duct cancer was very malignant and might be pure, or mixed with the papillomatous type. Cysts containing papillomata or cancer were first small cysts. The epithelium of the large cysts is so atrophied and degenerated that it is no longer capable of responding to the stimulus of further irritation. Many surgeons were saying that because they had never seen cancer in breasts from which they had removed cysts, therefore cancer in cysts must be rare. There was nothing in that statement. He had had a breast sent him for examination which had been removed for cysts only. In it was a multi-radicular papilloma, and near it a focus of cancer invading the fat around it. Again, if surgeons removed cystic conditions they had removed possible sites of cancer. The small cysts were the most dangerous as in them the epithelium was active.

SOUTH-WESTERN OPHTHALMOLOGICAL SOCIETY.—The next meeting of this society will be held on Monday, Oct. 24th, at Bristol Eye Hospital. At 2 P.M. cases will be shown, and Mr. Ransom Pickard will read a paper on the Development of Normal and Abnormal Disc Cups. At 7 P.M. there will be a dinner at the Grand Hotel, Bristol.

Reviews and Notices of Books.

INDUSTRIAL FATIGUE AND EFFICIENCY.

By H. M. VERNON, M.A., M.D. London: George Routledge and Sons, Ltd. 1921. Pp. 264. 12*s.* 6*d.*

THE study of the human machine in this country was given a remarkable impetus by the Health of Munition Workers Committee and the work started by them has since been carried on by the Industrial Fatigue Research Board. Reports have been issued from time to time upon work completed, but the time is quite ripe for a comprehensive review of the various investigations. This task has been undertaken by Dr. H. M. Vernon, who has been responsible for much of the work done and has brought to bear upon the practice of industry a training acquired in the laboratory.

Few can be aware of the amount that has been done on the subject, more in this country than in any other. The work summarised by Dr. Vernon deals with human activity and efficiency, the attributes of sound health. It suggests that in order to maintain his health, the industrial worker must do a good day's work, expending a reasonable amount of energy over his labour; but, on the other hand, by the avoidance of fatigue his efficiency is increased. Dr. Vernon supports his statements by carefully collected facts, whether he is dealing with hours of work and their distribution within the day, or within the week, with the length of spells of work or the interpolation of rest-pauses, with limitation of output, with sickness or accidents, or with the influence upon workers of such environmental conditions as lighting, temperature, and ventilation. He claims that "experienced industrial workers unconsciously adopt habits of work which tend to the production of a maximum output with a minimum of effort." Clearly anything which will lessen the effort will increase the output. Reduction of hours may increase total output, especially when the work is chiefly dependent upon the human as opposed to the mechanical element. The energy wasted in standing about for long hours can be made productive in a day of shorter hours; the slow rate of activity adopted when hours are over-long is uneconomical, just as is too rapid a pace resulting from "drive." Dr. Vernon considers, analyses, and finally condemns overtime as uneconomical, because it slows down work on other days; thus two hours of overtime added to an eight-hour day on two days a week tends to result in the pace for every day of the week being that of a ten-hour day. He arrives at the conclusion that for manual work, such as coal-mining, a seven-hour day is reasonable; for work partly manual and partly mechanical, such as engineering, an eight-hour day; and for mainly mechanical work, such as textile manufacture, a nine or ten-hour day. The six-hour day with multiple shifts is discussed with favour as regards internal administrative economy and the outside life of the worker.

Dr. Vernon is opposed to the Saturday whole holiday, at any rate for men; two days of rest are not needed to recuperate from five days of work. The extra day has to be paid for by longer hours on the other days, and Dr. Vernon reiterates that the pace worked depends on the longest day worked. The long week-end, moreover, permits lack of practice to become so pronounced as to increase the already low output of Monday. The ideal distribution of a nine-hour day is given as three spells beginning with one of 4 hours, a second of 2¾ hours, and a third of 2¼ hours, the last two being separated by 15 minutes for tea. In a chapter dealing with limitation of output and how to detect it, Dr. Vernon has included much previously unpublished information. The effect of fatigue upon diminishing personal respect and increasing drunkenness is discussed; employers are urged to keep and pool records for a more general investigation of this important subject, and of the effects of over-fatigue and occupational environment in impairing digestion and in lowering vitality. We read with some astonishment the conclusion that fatigue has comparatively little direct effect in increasing either sickness or mortality; it is the environment of labour rather than its severity which matters. In the discussion of industrial accidents and their prevention (incidentally, this section of the book is excellent) fatigue is regarded as less likely to be a cause of accidents than speed of production, inexperience, alcohol consumption, temperature, lighting, and the psychical state of workers.

A habit of mind as a means of prevention is placed far before mechanical contrivances; attention to environment and education of workers through safety committees are strongly advocated. The question of environment—that is, factory conditions—is regarded by Dr. Vernon as more important than any other in its effect on the consideration of output, and on this point he would have us concentrate. He has put his case well and we can only regret that his conclusions are not collected in a convenient summary at the end of the book; such a summary might attract even the busiest industrial magnate to the study of a book which, if it were widely read, might bring about a second and more desirable industrial revolution.

MEDICAL EXAMINATION FOR LIFE INSURANCE.

By THOMAS D. LISTER, C.B.E., M.D., F.R.C.S., M.R.C.P., President of the Assurance Medical Society; Physician to Mount Vernon and Royal Waterloo Hospitals. London: Edward Arnold and Co. 1921. Pp. 168. 10*s.* 6*d.*

IN view of the fact that most medical men in active practice are more or less frequently consulted in regard to life insurance, either in the capacity of medical examiner or medical referee, it is somewhat regrettable that, in this country at any rate, little if any attention is paid to the subject of insurance medicine in the medical curriculum. The problems which confront the practitioner in this connexion are entirely different from those of the diagnosis and treatment of disease with which he is more commonly concerned. In the examination for life insurance he has not only to appraise the present condition of the proposer's health, but also to consider his family and personal history critically and to make some attempt to assess expectation of life—that is, to determine whether the proposer is likely to live as long as the average of healthy persons of the same age. As referee the doctor is asked to give confidential information as to the proposer's previous health and habits, and also to express an opinion as to his prospect of surviving to the normal expectation. Life insurance medicine requires careful study, and for its application in practice a due appreciation of the responsible and confidential character of the reports required is necessary. We are not suggesting the addition to the student's statutory course of a new and compulsory subject, but only that the way to apply medical knowledge to insurance questions should be explained by teachers of experience.

There has long been a need for an up-to-date and authoritative manual on this subject, giving instruction and advice in regard to the various problems concerned, in such a way as to be helpful to the occasional examiner and to the medical practitioner asked to act as referee—that is, to report upon the health of his own patient. Dr. Lister's admirable book supplies this need exactly, and it would be difficult to commend it too highly. It deals with the theoretical considerations underlying insurance medicine only in so far as they are necessary to explain the procedures recommended, and detailed reference to statistical or actuarial considerations is wisely avoided. The information given is essentially practical, and every page reveals the author's wide experience. Dr. Lister writes so clearly and so well that what might have been a dry and technical book is most readable and interesting. Though primarily

intended for the occasional examiner and the medical referee, to whom it should be invaluable, there can be few connected with life insurance work who would not derive useful information and counsel from its perusal.

NEUROLOGY.

Clinical Examination of the Nervous System. By G. H. MONRAD-KROHN, M.D. Christiania, M.R.C.P. Lond., M.R.C.S., Lecturer in Neurology at the Royal Frederick University, Christiania. With a Foreword by T. GRAINGER STEWART, M.D., F.R.C.P., Physician to Out-patients, National Hospital, Queen-square. London: H. K. Lewis and Co. 1921. Pp. 135. 6*s*.

Dr. Monrad-Krohn's guide to the routine examination of the nervous system represents, we suppose, about the minimum requisite to cover the ground in a satisfactory manner, and yet it runs to over a hundred pages. We have gone over this little unpretentious précis of routine examination paragraph by paragraph and have no hesitation in warmly commending it to the student and the practitioner. It is really surprisingly comprehensive in view of its small compass. The inclusion of the Binet-Simon tests and of other psychological and psychiatric investigations adds to the all-round usefulness of the book, which should be in the pocket of every neurological student, at the bedside, or in the out-patient room, until such time as the routine examination of a nervous case has become second nature to him.

Diseases of the Nervous System. Third edition, revised. By H. CAMPBELL THOMSON, M.D. Lond., F.R.C.P., Physician to the Department for Diseases of the Nervous System, and Lecturer on Neurology, Middlesex Hospital. London: Cassell and Co. 1921. With 11 colour and 12 black-and-white plates, and 120 figures in the text. Pp. 566. 15*s*.

THE third edition of Dr. Campbell Thomson's text-book of nervous diseases appears after an interval of some six years. Incorporated in the book will be found paragraphs dealing with certain recent acquisitions in neurology, the result to a large extent of war experiences. Some modification has also been introduced into the chapters dealing with the neuroses and psychoneuroses, whereby they are brought more into line with the most modern teaching, though compulsion and anxiety neuroses receive a disproportionately small consideration as compared with hysteria and neurasthenia. Dr. Campbell Thomson's text-book maintains its position as embodying a sound, practical, and thoroughly up-to-date presentment of neurology for student and practitioner.

JOURNALS.

JOURNAL OF PATHOLOGY AND BACTERIOLOGY. Vol. XXIV., No. 4. Pp. 369–479. October, 1921.—Studies on the Pathology of Pneumococcal Infections of the Human Lung, by R. R. Armstrong and J. F. Gaskell. The authors have reinvestigated some points in the pathology of pneumonia, using a gelatin-embedding method for histology which preserves the natural relations of the parts more perfectly than the usual paraffin process. They believe that the pneumococcus invades the lung (*a*) by the air-passages, causing lobar or broncho-pneumonia according to the virulence of the organism and the resistance of the host, the essential histological lesions being the same in both cases; (*b*) by the blood stream, giving scattered miliary lesions without any exudate of polynuclear leucocytes; (*c*) by the lymphatics, giving rise to an uncommon type of relapsing pneumonia in children.—Digestion of the Œsophagus as a Cause of Post-operative and other Forms of Hæmatemesis, by J. H. Pringle, L. T. Stewart, and J. H. Teacher.—The Viscosity of Syphilitic Serum, by J. Holker. The viscosity of sera giving a positive Wassermann reaction does not differ very definitely from that of normal sera, but it increases a good deal more on keeping and on dilution with salt solution.—The Standardisation of Vaccines, by J. Holker. The author's opacimeter method gives accurate results with little labour.—Group Agglutination of the Gonococcus, by S. H. Warren. No evidence of groups was found.—Absorption from the Peritoneal Cavity, by C. Bolton. The peritoneal cavity is drained chiefly by the diaphragmatic lymphatics into the mediastinal lymphatics to the right lymphatic duct, and by intra-thoracic anastomoses to the thoracic duct. Particles up to the size of red blood corpuscles pass easily between the endothelial cells into the lymph, and the chief force is supplied by the respiratory movements. An important paper which should be consulted for the full results.—The Blood and Blood-vessels in Guinea-pig Scurvy, by G. M. Findlay. In experimental scurvy there is swelling and degeneration of the capillary endothelium which retards the blood flow and leads to local congestion; red cell counts of peripheral and heart blood are widely different.—Experimental Scurvy in the Rabbit and its Effect on Antenatal Nutrition, by G. M. Findlay. As is well known, rabbits deprived of antiscorbutic vitamin do not show any very marked signs of scurvy; the offspring, however, have hæmorrhages at the joints and in the internal organs.—Studies in Heterophile Antigen and Antibody, by T. Taniguchi. Further researches into this highly complex technical subject which must be studied in the original.—Blood-platelet Antiserum, by S. P. Bedson. The author prepared antisera by inoculating rabbits with the blood platelets, leucocytes, red corpuscles, and serum respectively of guinea-pigs, and examined their relative agglutinating action on the three particulate antigens with a view of elucidating the genetic relationships of the formed elements of the blood. On this basis platelets are certainly distinct from leucocytes, but the distinction between platelets and red cells is not so clear nor is that between red cells and leucocytes.—A Case of Erythema Nodosum from which an Organism Resembling *B. influenzæ* was Obtained from the Blood, by E. Emrys Roberts.—Two Cases of Typhus Fever in which *B. proteus* was found in the Cerebro-spinal Fluid, by J. M. Anderson.

IN THE MILITARY SURGEON for September, Colonel L. B. Wilson, U.S.M.C., discusses the Dispersion of Bullet Energy in Relation to Wound Effects—in other words, the explosive action of high-velocity bullets. The wounding effect of a projectile depends on its mass and on the square of its velocity, and the smooth-bore bullet, though heavy, was slow. Rifling was invented long ago, but at first it only made shooting more accurate; not until about 1725, when the greased patch or wad was introduced, which conquered windage and prevented the leading of the grooves, were firearms revolutionised. Then bullets gained velocity sufficient to give large animals fatal wounds. The rifleman could now use larger powder charges, and muzzle velocity increased from 500 to 1500 or 2000 foot-seconds. This high-velocity missile, says Colonel Wilson, was a very potent factor in the winning of the colonists' war for independence. In the Civil War of 1862, speed of fire seemed so very important that the question of high velocity rather dropped into the background. Kocher of Berne was the first to publish (1875) an account of experimental investigation of the wounds produced by high-velocity projectiles. Bullets with muzzle velocity of 2000 f.s. produce at short ranges explosive effects, which were occasionally seen in the Spanish-American War (1898); bullets of 3000 f.s. produce them at longer ranges. True explosive bullets, often heard of, are rarely seen; the author has examined thousands of German cartridges, but only found one explosive bullet: it was taken from a German ammunition dump in the Argonne. The explosive effects so often mentioned are due to the high velocity of the bullets used. Colonel Wilson has made a great many experiments on the effects of high-velocity bullets by firing them at a standard range of 50 feet into cardboard boxes filled with gelatin of varying densities. The gelatin blocks have been varied by putting powdered charcoal on the face of the block or in its centre, and by weaving

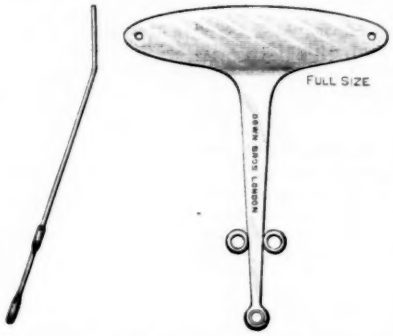
threads through the mass, to get evidence of what happens as the bullet passes through. He found that the explosive effect radiated from the track to a distance varying inversely as the square of the density of the gelatin, four times as far in 5 per cent. gelatin as in 10 per cent., sixteen times as far in 5 per cent. as in 20 per cent., and so on. Similar principles seem to hold for the tissues of the body. The influence on treatment is clear. The track of a pistol bullet may only need superficial cleaning, but the track of a high-velocity bullet needs wide opening up. Tough tendons and aponeuroses are likely to be torn out of the tissues by the bullet which pierces them. In soft tissues, liver, kidney, &c., the damage is very extensive. Owing to the low viscosity and density of the blood, damage spreads far along the vessels, and there is special risk of thrombosis, secondary hæmorrhage and aneurysm, so that if a bullet passes near a large vessel the latter may require to be tied well away from the track. This paper merits the attention of all military surgeons.—Lieut.-Commander C. S. Stephenson, U.S.N., contributes a thoughtful paper on "Syphilis and Venereal Disease, a Service Liability." He notes that stopping men's pay for venereal disease leads to concealment of disease and at times to injustice, and concludes that laws and penalties against venereal disease are unwise and ineffective. The only practical law will insist on prophylaxis, punishment following disobedience; in other respects venereal patients are to be treated exactly as others, but means of infection are to be kept away from the men, as was done during the war.—Lieut. D. F. Elmendorf, U.S.M.C., examined 40 men of the American force in Germany for Vincent's angina and found 35 of them were carriers; examination was made by dark-ground illumination.

JOURNAL OF LARYNGOLOGY AND OTOLOGY. July and August, 1921. Vol. XXXVI., Nos. 7 and 8.—The July number contains a study by S. Mygind of Copenhagen of the reflex movements of the facial muscles elicited by rotation and apparently due to vestibular stimulation; as they are not obtained after the age of six weeks, they do not appear to possess a direct clinical value. This is followed by a series of statistical tables from the ear and throat department of the Edinburgh Royal Infirmary for the years 1919 and 1920; it gives the number of cases of the different diseases treated in each year, occupies ten pages, and would have been more interesting if it had been accompanied by a commentary.—Mr. E. B. Waggett describes an interesting case of a large chondroma growing from the cricoid cartilage successfully removed through a lateral external incision.—Dr. James Don relates a case of encephalitis lethargica in which the diagnosis was obscured by chronic bilateral aural suppuration; a radical mastoid operation was performed on the right side, without affecting the general condition, and the patient eventually recovered. ——To the August issue, Sir William Milligan contributes a short note on diathermy in inoperable cancers of the throat; Dr. Logan Turner gives an account of six cases of vocal cord paralysis secondary to malignant tumour of the mamma, with a careful description of the anatomy of the lymphatics concerned.—Dr. F. G. Wrigley describes a case in which the cavernous sinus probably became thrombosed secondarily to an otitis media, and in which the clot was expelled on opening the healthy lateral sinus with eventual recovery.—Dr. Albert Gray gives a summary of various theories of hearing; he disagrees with Wrightson's theory, as it involves the final analysis of tones in the brain, and favours Helmholtz's theory, which embodies the principle of "sympathetic resonance" and analysis in the cochlea, with a modification of his own; agreeing that the basilar membrane vibrates over a large area in response to a given note, he argues that it is the point of maximum vibration which determines the sensation of pitch.—The reports of societies' proceedings have been greatly abridged in order to make up the arrears into which they had fallen; they are still six months behind.

New Inventions.

HARE-LIP SURGERY: A SUGGESTION.

CASES of hare-lip and of the more common congenital abnormalities are seen in considerable numbers among our out-patients to-day. The after-results of operation are often deformity or disfigurement, common troubles being a plain notch at the lower end of the operation scar, and a certain amount of keloid thickening of the scar. This is no doubt caused by upward contraction of the scar tissue, occurring in this region because of the large amount of fibrous tissue entering into the construction of the upper lip. A post-operative straight lip is a rare occurrence. The mechanical means described below are devised to overcome this contracture, and, as it were, to "hyperextend" the seat of operation. The angle of incision and the point of juncture of the two halves of the lip are best left to the individual surgeon. It is the practice at present to bring the lip together by means of skin sutures. This I feel sure plays a great part in causing the prominent after scar. Approximation of the parts can be brought about as well by Czerny sutures from the mucous side of the lip, causing little or no tension on the scar. I venture to suggest these sutures for general use in hare-lip surgery. As a mechanical means of overcoming the contraction, I use the splint illustrated immediately



after operation. Made of silver, the instrument is small and easily handled. It has a main shield-shaped body, carrying two small needle-holes at the extremities, and a projecting arm with three small rings attached as suture anchors. This arm is bent away from the main body at an angle of 15°, thus precluding any interference with the feeding of the patient. The splint is applied immediately after operation. Thin silkworm gut is used as suture material. The splint is sutured to the upper lip through the two holes in the body of the instrument. A circular suture is passed through the lip at the point of juncture, and two sutures at each side at a distance of a quarter of an inch. These are fastened to the rings on the projecting arm, and a slight amount of tension applied, thus pulling forward and downward the lip at the site of operation. The splint is kept applied for eight to ten days after the operation. The continued tension on the lip causes a curve downwards, which, allowing for subsequent contracture, leaves a presentable lip and no unsightly notches.

The instrument has been made for me by Messrs. Down Bros.

Harley-street, W. L. SAMUELS, M.D. Sheff.

THE LATE DR. REGINALD LAWSON MOSLEY.—Dr. R. L. Mosley, who died on Oct. 6th at Shaldon, South Devon, in his sixty-fifth year, was a graduate of Dublin University, where he graduated B.A. (first-class honours) in 1879 and M.B. two years later. In 1880 he became L.R.C.S.I. and L.M. of the Rotunda Hospital, Dublin.

THE LANCET.

LONDON: SATURDAY, OCTOBER 22, 1921.

The National Insurance Act.

THE Minister of Health met the deputation from the Insurance Acts Committee of the British Medical Association last week, and informed them of his intention to act on a decision of the Government and to reduce the present capitation fee paid to insurance practitioners from 11*s.* to 9*s.* 6*d.*, the alteration to take effect in the new year. Sir ALFRED MOND, in pointing out the necessity under which the Government lay to make a severe revision of all possible expenditure, admitted that he found the position of his Ministry an unenviable one, considering the beneficent health operations lying immediately ahead, but he relied on the patriotism of medical men to acquiesce in the lessened payment. He certainly made it clear that the reduction proposed has no other object than economy, for at the time of announcing the reduction he spoke in high terms of the services rendered by practitioners on the panel, whom he defended, after personal investigation of the facts, from the widespread and sometimes bitter attacks on their work which had appeared in the lay press. In spite of which Sir ALFRED MOND felt himself compelled to propose a reduction in the scale of remuneration, and to do so in face of the fact that an independent body of arbitrators had arrived in March of last year at the present figure as a fair one.

It having been explained that the deputation of the Insurance Acts Committee was in fact an Executive Committee of a Representative Conference shortly to take place, before which body Sir ALFRED MOND'S proposition would be placed, the meeting was adjourned to give the deputation the opportunity of considering the situation privately. After the adjournment Dr. H. B. BRACKENBURY, as spokesman for the deputation, put forward the views which it would be necessary to lay before the Conference. He pointed out that to call on the medical profession to surrender on patriotic grounds a large annual sum of money which had recently been found to represent fair remuneration was illogical if the reply to such a patriotic call resulted in rendering the national medical service not so good or so effective as at present; and he added that no exact data are available as to the amount of labour involved in panel work, though at the present figure of 11*s.* there was, he thought, risk lest the service should not be stable, and keep intact its large membership of able practitioners. From the moment when it became clear that the remuneration of panel practitioners would probably be made the subject of early reduction, we have pointed out in these columns the existence of this danger; we are sure that it is real, and that if a too thorough or too hasty policy of economy be pursued the loss of practitioners from the panel may include some very valuable persons. Until the data are available, whose absence Dr. BRACKENBURY alluded to, it will be difficult to persuade practitioners that the reduction is fair. The Federation of Medical and Allied Societies is in cordial agreement with Dr. BRACKENBURY in asking for information, and has for some time placed in the forefront of its programme the securing of an inquiry into the working of the Acts as being a condition necessarily precedent to arriving at full comprehension of what is being done, how well or ill it is being done, and how far the payments made are in fair correspondence with the services rendered.

In reply to Dr. BRACKENBURY'S representation Sir ALFRED MOND hoped that the proposal of the Government when placed before the Conference would be accepted, as he was not in a position to haggle, but he stated that an inquiry into panel work was about to be made, which would cover all the ground and be made without prejudice. Does this mean that the new figure is temporary? The Conference will be well advised to think of this point, for it is a most important one. A very real source of trouble to practitioners, arising out of the proposed reduction of panel remuneration, is the upset that may be caused in arrangements already entered upon. Practitioners, reckoning reasonably upon a certain income, have made plans for the taking of premises, for the education of children, and so on, any of which may have to be modified sensibly under a heavy reduction in the scale of remuneration. So vexatious an element of uncertainty ought to be eliminated, at any rate for a substantial period, in any new arrangements. Referendum papers have now been issued by the British Medical Association, asking for the views of practitioners as to the acceptance of a capitation fee of 10*s.* and the advisability of refusal to serve at the reduced fee of 9*s.* 6*d.* The conclusions of the Conference will not be available for publication in this issue of THE LANCET.

The Spread of Plague.

THE news that two or three violent recrudescences of plague have occurred in some parts of India, and that some of the Australian ports appear to have been recently re-infected from outside, naturally suggests the question as to whether we are really any nearer coping with epidemic bubonic plague than we were 20 years ago. The main facts concerning the spread of plague are, of course, well known to everybody; there is no necessity to repeat them here. Quite recently a very important report has been published which may be described as the first real attempt on a large scale to eliminate plague infection from a given district. This is contained in a paper by Major KUNHARDT and Asst.-Surg. CHITRE in the *Indian Journal of Medical Research*. It should, however, be mentioned that a reference to this work has appeared in THE LANCET before, but owing to the war the full and detailed report has been considerably delayed. The work was carried out in 1914, 1915, and subsequent years.

The general plan of campaign to be adopted was something as follows: From a careful study of recrudescences of the disease in villages it was observed that when a particular village was infected in the "plague season" a violent epidemic resulted, but there appeared to be no tendency for the disease to recur in future years unless re-importation of the virus occurred. Should a village be infected at the very end of the "plague season" an abortive epidemic only is the result; this occasions a certain amount of rat mortality and a few human cases, but such a mild attack in no way resembles the classical picture of a plague outburst. It was also observed that in those

villages where this abortive outbreak occurred, as soon as the climatic conditions became favourable cases at once reappeared and a more or less violent attack followed. Hence, these late infected centres acted as reservoirs of infection during the "off season" and when conditions for the spread of the disease recurred they formed centres from which dissemination of the disease into the neighbouring villages would take place. These facts have, of course, been well known to epidemiologists for a considerable time, but Major KUNHARDT and his assistant went further; they argued that if something could be done for these late infected villages during the off season, recrudescence might be prevented; and conversely that it was useless to attempt any measures in the villages that had passed through the ordeal of an ordinary violent epidemic. A large tract of country in the Deccan comprising parts of the districts of Poona, Ahmednagar, Satara, and Sholapur were selected for experiment, a careful study of the plague figures village by village being carried out. During two years 458 villages were infected. Of these 218 were thrown out at once as quite unlikely to "carry over." At a more detailed examination another 189 were also discarded. It was thus decided to concentrate operations on 50 places—that is, about 10·9 per cent. of the total number infected. The work on these 50 places consisted mainly of a very determined attempt to rid the places of rats. Subsequent events showed that of these 50 places, 20 carried plague over to the following season in spite of these measures. Out of the 407 places excluded as being unlikely to carry over the disease, only three (all in the second year) continued to harbour the disease. In all three of these special circumstances existed explaining this. From this work the following conclusions are legitimate. First the method of recognising centres of infection that are likely to carry over the off season is useful, though admittedly crude. Second, that the failure to eradicate plague was due to the non-success of the rat campaign, and thirdly that the off season centres of infection are more important than importation from without.

A second important paper by the same authors is published in the *Journal* giving in detail the results of their experiences on rat extermination. The actual conclusions of this paper have been previously published. Two outstanding points may be referred to—namely, that hydrocyanic acid gas as a means of exterminating rats in the ordinary native house was a failure, and second the best rat poison used was found to be barium carbonate. Thus it will be seen that the campaign to rid the area of infection, so admirably conceived and thoroughly carried out, broke down for the simple reason that we cannot free the Indian village of rats successfully by any means at our disposal at present. Work is still going on which will sooner or later bear fruit. Had it not been for the upset of the services in India during the war, probably success in this direction would have crowned the efforts of the workers by this time. The problem of ridding large countries of plague infection is an extremely complicated one. The difficulties, as we have already shown, of rat extermination in a tiny little area like one Indian village are enormous. Armchair critics of the Government of India in this country sometimes talk in a light way about keeping rats out of human habitations by constructing rat-proof buildings. These individuals do not appear to recognise the fact that practically every home is a grain store as well, and that it is impossible, at present, to keep grain in bulk outside of villages and out of human habitations. Something may be done to educate the people to see the disadvantages of harbouring the rats in their houses, but the East moves very slowly, and the mud house common in many parts of the country is the only one that the inhabitants can afford, and it possesses certain advantages over any other type in a climate such as India. Even when the immediate difficulties of rat campaigns have been overcome there are still other problems in connexion with plague that have to be investigated, such as the way in which the traffic influences the spread of the disease by importation. We publish this week (see p. 853) a preliminary report upon the Manchurian plague epidemic of 1920–1921 by Dr. WU LIEN TEH, the chief executive officer of the Chinese Plague Prevention Service. The full report will not appear until next spring, but the findings published are interesting, and have a close bearing on many of the problems present in India.

Preventive Surgery.

THERE are certain periods of revision through which every art, nation, business, or individual must pass at times; periods in which the results of previous work are surveyed in a critical spirit, and plans for the future are considered. Through such a period of reconstruction surgery may now be passing. The last 40 years have been marked by progress on a truly extensive scale, till to-day there is no part of the human frame safe from surgical enterprise, and few diseases for which surgical remedies have not been attempted, or at least suggested. Yet, apart from the notable advances made during the war in thoracic surgery and the plastic surgery of the face, the closing years of this period have seen few really new realms explored and few startling innovations brought to light, while many of those of a former generation have been abandoned. The surgical advance inspired by LISTER has reached a position in which its leaders consider it wise to consolidate; and if in the process some of the furthest salients have proved to be untenable, there is about the whole position a security which is reassuring to the spirit of the mass of workers. Surgical procedure has become standardised and simplified, and the tendency of the more important writings that have appeared of late has been critical rather than intrepid. There is a general tendency among writers to admit that nothing startlingly new is likely to appear, and to look for improvements in surgery rather to new methods than to new principles.

An article by Mr. PHILIP TURNER on the Principles of Preventive Surgery, published in a recent number of the *Guy's Hospital Gazette*, furnishes an example of a desire on the part of surgeons to look at their profession from a broadly different standpoint from that taken up even 20 years ago. Mr. TURNER discusses the great part which preventive medicine has come to play in our national life, and seeks to apply the preventive principle to matters surgical. This is not an easy task. Surgery deals essentially with abnormalities already established, steps in where prevention has failed; and, unless we are to advocate the routine performance not only of circumcision, but of tonsillectomy, cholecystectomy, gastro-enterostomy and appendicectomy, and to forestall the ills which these operations now cure, it is hard to conceive a place in our text-books for preventive surgery as a special branch, or to contemplate the addition of a "D.P.S." to the diplomas of an already over-examined profession. If the considerations put forward by Mr. TURNER are studied—and they well repay study—his views on

preventive surgery are found to be a plea for (1) measures that come under the heading of preventive medicine and education; (2) earlier diagnosis, and therefore earlier and more hopeful surgical treatment; (3) better surgery. The first is the ideal of the work before the Ministry of Health. Early diagnosis is a question already receiving earnest attention, and it is one of the main lines along which surgical advance is to be looked for in the future. With earlier diagnosis will come better operative results, as has already happened in cancer of the stomach, and often the avoidance of an operation. On the third count Mr. TURNER points the way to improvement. He speaks of the prevention of deformities which occur after fractures; but surely the treatment of a fracture so that deformity does not result is not preventive surgery but good surgery. So, to quote another instance, is the splinting of an ankylosing joint so that the resulting position of fixation shall be that most useful to the patient. That faulty ankyloses and malunited fractures are of lamentably frequent occurrence is a criticism which surgery has deserved. There are too many surgeons whose interest in the patient begins with the first incision and ends with the last safety-pin.

It is, however, becoming more and more evident that the operation is, in most cases, but one step in the treatment, and not a magic intervention, a wave of the wand which shall make the patient live happily ever after. This sounder, if less dramatic, outlook on surgery finds its expression nowhere better than in the repair of the injuries and deformities left by the war. It has been proved in many a military orthopædic hospital that the surgeon who gets the best results is not the brilliant operator, but the patient worker. A nerve suture is not merely a piece of deft needlework; its success depends upon a study of the man as well as of the lesion, a planning of the details long before the date of operation is fixed, a patient careful re-education of muscles and morale carried on for months afterwards. Still more does this apply to bone-grafting, where the most skilful carpentry will end in failure unless preceded by the correction of deformities and ankyloses, the excision of devitalised tissues, and the establishment of nutrition in the limb, to be followed by a carefully graduated resumption of function, which is the only call to consolidation to which the new bone will respond. These things are tedious, but they are as important as the operation, and they cannot be left to subordinates. The call for preventive surgery will result largely in the application of more of the surgeon's time to the essential if less dramatic details of his work.

L.C.C. AND CARE OF THE BLIND.

THE Ministry of Health has approved the essentials of the scheme prepared by the London County Council for the welfare of blind persons in the County of London, particulars of which appeared in THE LANCET of August 6th. The Minister has expressed special satisfaction that a Central Council is to be established, and suggests that in carrying out the scheme every effort should be made to encourage the voluntary side of the work. The London County Council has appointed a Special Committee to administer the scheme, which will operate from Nov. 1st. Since the Central Council will consist principally of representatives of societies and associations dealing with the blind and persons with special knowledge of the needs of the blind, it has been decided not to appoint coöpted members on the County Council Special Committee.

Annotations.

"Ne quid nimis."

VENEREAL DISEASES IN U.S.A.

THE weekly report of the United States Public Health Service, dated Sept. 2nd, contains a summary of the work carried out in coöperation with the various State boards of health in combating venereal diseases during the past two years. The summary is divided into sections dealing with medical, educational, and legal measures, and with comparative activities in various States. Amongst the medical measures recorded are the following: establishment of 427 venereal disease clinics; the giving of 2,103,900 treatments to 185,200 clinic patients (at a cost of less than $1 per person in the most efficient clinics); discharge of 41,100 patients as non-infectious; following up by social workers of patients who cease attendance before cure, and of patients' families; the obtaining of the coöperation of 28,000 druggists in checking sale of patent remedies, and of a pledge of coöperation from 60,700 physicians. It is also noted that 15,000 placards have been posted; that of 20,000 newspapers and magazines all but 200 have agreed to remove or refuse advertisements of quack doctors; and that in 16 States it is unlawful to sell patent remedies. The same mass action is apparent on the educational side; 740,000 young men and boys have seen the "Keeping Fit Exhibit," 13,000 lantern lectures have been delivered, 3600 kinema shows have reached audiences totalling near 1½ millions of people; and so on. Conferences of teachers, distribution of literature, special lectures to coloured people have all been directed to the one end; moreover, legislation has been kept abreast of the spread of public enlightenment. Many houses of prostitution have been closed, and men found in such houses are now prosecuted equally with women. Three hundred and fifty ordinances dealing with the control of venereal diseases have been passed, and several States now have quarantine houses in which to harbour persons whose disease constitutes a danger to the public health. Institutions for the care of the feeble-minded are receiving particular attention, and much money is being spent to enable them to take care of persons who, if not under proper control, would be the means of spreading infection. The number of social workers employed is growing, and an increasing intelligence and efficiency is demonstrated in the handling of women suffering from venereal disease. Such well-directed and widespread effort cannot fail to have a very marked effect upon conditions of public health in the United States.

STUDY OF EMBRYOLOGY BY MODELS.

To the student the study of embryology is too often a matter for despair, since the only satisfactory way of getting a grasp of it is by practical work with embryological material. This entails not only a larger supply of embryos than it is possible under present conditions to obtain, but also a considerable amount of technical knowledge and skill, and more of the teacher's time than can usually be spared. The difficulty has even led to the pessimistic suggestion that this subject be excluded from the syllabus of medical examinations. There is, however, a possible solution—the use of accurate reconstruction models of whole embryos and their constituent organs. These, though occasionally seen on shelves in museums, are seldom used, and far too much reliance is placed on pictures, which however realistic, can never give as good an idea of structure as a model. An interesting series of models shown by Miss I. C. Mann at the meeting of the Section of Ophthalmology of the Royal Society of Medicine on Oct. 14th represented stages in the development of the human eye; they were

reconstructions to scale (magnification of 100) of the eye and adjacent parts of the brain in human embryos up to the third month. The processes of outgrowth of the optic vesicle and its subsequent invagination to form the optic cup were clearly seen, while the formation of the choroidal fissure, always a stumbling block to students and difficult to show in a drawing, was made plain at a glance. The separation of the lens vesicle from the ectoderm was well shown in the model of the 7·5 mm. embryo, in which also could be seen the earliest stage of development of pigment in the outer layer of the optic cup. Given a series of models such as these, the path of the lecturer would be considerably smoothed, and the student, whether of ophthalmology or anatomy, would acquire a greater interest in a subject at present often obscure and depressing.

DIGESTION OF THE ŒSOPHAGUS.

POST-OPERATIVE vomiting of black material or actual hæmatemesis is a well-known symptom, and one of grave import. Mr. J. H. Pringle, Mr. L. T. Stewart, and Prof. J. H. Teacher, of the Royal Infirmary, Glasgow, have recently shown[1] that in some of these cases the blood comes not from the stomach but from the œsophagus, which is ulcerated and digested by the regurgitation of stomach contents or by a failure to clear the œsophagus of digestive liquids after actual vomiting. The lesions vary in severity from superficial erosions to the destruction of the wall of the œsophagus and even of the surrounding tissues, and evidence has been found of spontaneous healing. The practical indication is obvious—that the œsophagus should always be washed out after vomiting—and we find here the explanation of why our mothers always gave us a drink of water after we had been sick.

PREGNANCY FOLLOWING IMPLANTATION OF OUTER END OF ONLY REMAINING TUBE.

IN the *Johns Hopkins Hospital Bulletin* for September Dr. H. N. Shaw has reported a remarkable case in which pregnancy followed implantation of the outer end of the only remaining Fallopian tube after resection of a cornual pregnancy. A woman, aged 36 years, was admitted on Oct. 3rd, 1919, complaining of irregular menstrual periods. She had been married six years, and had had one child and two miscarriages—one nine months after marriage at three months, and the other in March, 1919, at two and a half months. A regular period apparently occurred four weeks before admission. A few days before admission irregular bleeding began. This increased in amount, but no large clots were passed. On examination a median abdominal scar was found. The uterus was apparently normal in size and position, but at the left cornu was a rounded mass several centimetres in diameter, not tender, and rather soft and fairly movable. Left tubal pregnancy was suspected. Laparotomy was performed by Dr. Cullen. The old abdominal scar was excised. On opening the peritoneal cavity an adhesion between the uterus and scar was found. It was clamped, cut, and tied. (In 1918 at another hospital the uterus had been suspended and the right tube and ovary removed.) In the left uterine cornu was a tumour 5 by 4 cm., on the median side blending with the surface of the uterus and on the outer side continuous with the tube—undoubtedly a cornual or interstitial pregnancy. The tube was temporarily clamped at its cornual attachment, and the cornu resected, leaving a raw area 4 by 2 cm. at the uterine attachment. The Fallopian tube was drawn into the cornu so that its inner end lay in the uterine cavity. The wound was then approximated. The excess of bladder peritoneum was drawn over the raw area to prevent adhesions. After the operation the fimbriated end of the tube which lay free was about 1 cm. long. A cigarette drain was placed in the lower end of the abdominal incision, which was closed. Recovery followed. Sections through the cornual pregnancy showed in the centre of clot an early placenta and typical chorionic villi. In March, 1921, the patient was confined at seven months. There was marginal placenta prævia with a breech presentation. The child was born dead. Although from time to time the inner end of the resected Fallopian tube has been inserted into the uterus, Dr. Shaw has been able to find recorded only one similar case. For years Dr. Cullen has been teaching at the Johns Hopkins Hospital the utmost conservatism in dealing with pelvic conditions during the child-bearing period. Wherever possible he has preserved the menstrual function, believing that the unsexing of a woman in early life is more deleterious than the possibility of a second abdominal operation. In this case the logical procedure seemed to be removal of the tube, but the saving of the outer portion and its insertion into the uterus proved to be worth while. As the patient is still under 40, the possibility of other pregnancies remains.

[1] Journal of Pathology and Bacteriology, vol. xxiv., p. 396.

DUODENAL FISTULÆ AFTER RIGHT-SIDED NEPHRECTOMY.

IN a recent number (Oct. 1st) of the *Wiener medizinische Wochenschrift* devoted to urology, in which sympathetic reference is made to the late Prof. Zuckerkandl, Dr. E. Felber gives an interesting account of the occurrence of duodenal fistulæ following right-sided nephrectomy. He discusses the anatomical relations of the right kidney and duodenum, and says that the normal variation in the actual position of the duodenum does not affect the intimate relationship of the second or descending part of the duodenum with the renal pedicle. Inasmuch as the peritoneum does not envelop the duodenum but only covers its anterior aspect, injuries to the intestine may occur without coincident injury to the peritoneum. The literature contains several references to duodenal injury in right nephrectomies, and nearly all these cases have resulted in the death of the patient from inanition.

Felber quotes a recent case of his own in which tuberculous disease of the right kidney called for a nephrectomy, which was performed by the late Prof. Zuckerkandl. The subcapsular operation was decided upon owing to widespread perinephric thickening. Two clamps were placed on the renal pedicle; the distal of these slipped, and owing to the trauma inflicted by it upon the structures of the pedicle, there was a severe hæmorrhage. The kidney was removed, and the bleeding pedicle secured and ligatured. On the tenth day the dressings were found saturated with contents of the upper portion of the small intestine; the jejunostomy performed four days later with a view to controlling the patient's inanition availed little, and death occurred ten days afterwards. The course of this case is explained by the assumption that the ligature on the renal pedicle included an area of the duodenal wall, the fistula developing owing to necrosis of this portion of the intestine.

W. J. Mayo reports three similar cases, in which the pedicle was infiltrated either by inflammatory or neoplastic processes. Hæmorrhage was encountered in each, and clamps had to be left on the pedicle at the close of the operation. All three developed duodenal fistulæ, with rapidly fatal results. Legueu and Pousson quote similar cases with the same unfortunate ending.

Payr reports one case of unusual interest. A woman, aged 31, had a right nephrectomy for a pyonephrosis. A small fistula remained after healing of the wound, and proved to be most intractable, defying all efforts to close it. Eventually the track was injected with bismuth paste with a view to X ray photography. A surprisingly large amount of bismuth was injected with but little pressure. The plate revealed the presence of the bismuth in the small intestine. Payr extirpated the fistula and repaired the duodenum with a three-tier suture. Recovery ensued, which the patient owed to the fact that intestinal contents did not pass out through the fistula.

It is evident that injuries to the duodenum usually occur in those cases in which difficulty is experienced in ligating the renal pedicle, and the surgeon is confronted with a serious hæmorrhage in a confined space. But there are other cases in which such pathological

changes have taken place in the pedicle that only special precautions will enable the surgeon to avoid the danger. Such changes are prolonged suppuration in or around the kidney, and carcinomatous infiltration of the pedicle, with subsequent matting of all the structures in the neighbourhood. Such cases may be dealt with in one of three ways, viz. :—

1. Ligature of each vessel individually.
2. Subcapsular nephrectomy with control of the renal vessels by the fingers until complete removal of the kidney, when the vessels can be readily caught and tied.
3. Transperitoneal nephrectomy, especial y when dealing with malignant tumours.

The question arises of the treatment of those cases of duodenal injury in which the resulting duodenal fistula will inevitably cause the death of the patient if not treated. Jejunostomy is of no value, because the loss of bile and pancreatic secretion still continues and the inanition progresses. The fistula must be exposed and closed. Payr successfully dealt with his case by a three-tier suture, but McGuire Stuart maintains that a direct suture is rarely successful, and advocates Mayo's method. The duodenum is mobilised by incising the peritoneum along its right border, and then rotated forwards and inwards to give a full exposure of the wound in its posterior surface. The defect is closed by several layers of sutures, and afterwards covered by peritoneum. At the same time a temporary jejunostomy is performed for feeding.

CORRECTION OF ASTIGMATISM.

A CORRESPONDENT suffering from headaches which get worse on using his eyes writes to THE LANCET to complain that although he has consulted several oculists, and they have all given him nearly identical prescriptions to correct his astigmatism, his headaches remain unrelieved. The causes for this unfortunate result may be various. In the first place, his headaches may not be truly ocular at all, but dependent on the vascular system, and made worse by the stooping of the head usual in reading. In the second place, the astigmatism may be irregular, the result of a corneal scar, and therefore incapable of being wholly corrected by glasses. Thirdly, a fully correcting spectacle-lens accurately centred neutralises an error of refraction only when the line of vision passes through its optical centre. When, however, the line of vision is excentric (as, for instance, in reading a line of print without moving the whole head) the error will be over-corrected, and in the case of a strong lens considerably over-corrected, a fresh element of astigmatism being introduced. Hence patients whose error of refraction is high, whether astigmatic or not, usually find a full correction less satisfactory than a partial one. It must be noted, however, that this difficulty can be got over to a great extent by the device of periscopic lenses—i.e., concavo-convex—with the concave surface next the eye. In the fourth place full correction of refractive errors may throw extra work on the extra-ocular muscles in the effort to maintain binocular vision. Cases of high oblique astigmatism sometimes illustrate this. The oblique muscles, one of whose functions it is to maintain parallelism of the visual axes during vertical movements, resent having to do their work under totally new conditions, so that in prescribing glasses it may be necessary to compromise in the matter of the obliquity of the axes of the cylinders prescribed. Far more commonly the difficulty experienced by the extra-ocular muscles is due to an inequality in the refraction of the two eyes. When this is present an unequal prismatic effect is produced by directing the line of vision in any direction except through the optical centre of the two lenses, the inequality of the prisms being greater in proportion to the inequality of the lenses. This throws unequal work on the muscles, and in the case of the vertically moving muscles, work which they are very likely incapable of performing except at the cost of a great nervous strain. Hence the glasses which might cure a headache due to astigmatism might cause another headache due to hyperphoria. The remedy, of course, is to be found in compromise—a partial instead of a complete optical correction, but in extreme cases it may be necessary to abandon any attempt to secure binocular vision.

TIMES AND SEASONS.

THE third verse of the nineteenth Psalm, in the Prayer Book version, runs as follows: "There is neither speech nor language, but their voices are heard among them," and the Septuagint version says: "There are no speeches or words in which their voices are not heard." And the meaning of the passage is that although there be no audible speech among the stars, yet their language is intelligible to all nations. "In the stars," says a noted sixteenth-century preacher, "the countryman finds instruction for the times of his labour, the seaman for his navigation, the mathematician for his observation. So that the husbandman and the sailor who cannot read can yet understand the stars, and the philosopher who has read every book that was ever written cannot fathom their meaning." In a review of the volume of Annals of Medical History, which appeared in THE LANCET for Oct. 8th, it was noted that the diagram in the Handbook of Byrhtferd contained two circles showing the relations of the month to the movements of the moon. This calendar, as Dr. C. Singer points out, was evolved about A.D. 525, and is the Dionysian cycle in which the months consisted of 29 and 30 days alternately, an intercalary month of 30 days being inserted seven times in 19 years. Although, as Dr. Singer says, this calendar "has no practical value except for the calculation of Easter," he is not quite correct, except as regards Westerns, for the same, or essentially the same, calendar is used to-day by Mohammedan nations as a religious calendar. The month begins at sunset of the day when the new moon is first seen after sunset. Every odd month has 30 days, every even one 29, except in leap years, when the last month also has 30. It is not a convenient calendar, for every month retrogrades through all the different seasons of the solar year in a period of about 33½ years owing to the difference between the lunar and the solar year of about 11 days. Thus in the year 1880 the month Moharrem began on Dec. 4th; in 1890 it began on August 17th, and by 1912 it had got back again to Dec. 11th; but it is a matter of interest to all subjects of the British Empire that a sixth-century calendar should still be in use among the people of a large part of that Empire.

PARATYPHOID FEVER CAUSED BY "HEAD-CHEESE."

THIS outbreak of paratyphoid fever[1] in November, 1920, in a small American town is of considerable interest from a number of points of view. The cases were at first thought to be influenza with sudden onset, headache, chills, pains in joints, and rapid rise of temperature from 102° to 104° F. There were no pulmonary symptoms, and later clinical and bacteriological evidence showed that the condition was paratyphoid fever. Prolonged high temperature, papular eruption, and other symptoms of paratyphoid fever were present. Bacteriologically the diagnosis was confirmed by the isolation of *B. paratyphosus B* from the blood of two of the cases, from the stools of three cases, and by a well-marked positive agglutination reaction exhibited by the serum of 19 out of 20 cases examined. The incubation period was from 2 to 13 days, with an average of approximately seven days. The epidemiological investigation elicited the fact that the persons attacked were from homes widely distributed throughout the town, and were of various ages, from 5 months to over 50 years. Thirty-three of the 44 cases developed

[1] Paratyphoid Fever. Report of an Outbreak in Cascade, Mont., caused by Head-Cheese. Public Health Reports. Washington: Treasury Department. 1921. xxxvi., No. 35.

within eight days from the date of the appearance of the initial case of the outbreak. In addition there were 11 secondary cases. Inquiry showed that of these 33 primary cases 28 had definitely eaten suspected food, certain "head-cheese," a form of brawn, and the other five had eaten beef bought and served at the time when the suspected brawn was purchased. Circumstantial information from certain individual cases shows clearly that the source of infection was the substance called in the report "head-cheese." No samples were available for bacteriological examination. but the food was prepared and sold by the proprietor of the meat market and his wife. It was ascertained that the wife had been ill, for a period of approximately four days, about three weeks before the outbreak. She assisted in preparing the suspected food two days before it was placed on sale. It was not found possible to examine her blood serologically, so the presumptive evidence that she was the cause of the outbreak could not be tested.

The little outbreak is of interest from two points of view. One is that recorded outbreaks of paratyphoid fever from contaminated food are still comparatively rare. The chief point of interest is the light it throws upon food-poisoning outbreaks. The prevailing German view, one also largely followed in America, is that the food-poisoning bacilli of the *B. aertrycke* or *B. suipestifer* types are identical with *B. paratyphosus B*—i.e., in other words, that the same bacillus may at one time cause paratyphoid fever, at another an attack of food poisoning. In the present outbreak, although an article of food was infected, apparently of similar nature to the foods which do convey food-poisoning bacilli, the resulting outbreak was paratyphoid fever, and did not show the clinical features of food poisoning. There was some, but not conclusive, evidence that infection originated from an unrecognised human case of paratyphoid fever and the infection bred true. The cases were all of one type, supporting the conception that *B. paratyphosus B* is a different strain not only serologically but in its ætiological functions from *B. aertrycke* and other bacteria associated with food poisoning, the one type causing paratyphoid fever only, the latter food-poisoning infections only.

POROKERATOSIS.

ACCORDING to Dr. Carroll S. Wright,[1] instructor in dermatology and syphilology at the University of Michigan Medical School, who reports an illustrative case in a man aged 40, porokeratosis was first described simultaneously by Mibelli and Resphighi in 1893. Since then not more than 60 cases have been recorded, the condition being particularly rare in the United States. In spite of the numerous theories that have been advanced the ætiology of the condition is still entirely unknown. Heredity undoubtedly plays a part, as was shown by two of Mibelli's cases, in which a brother and sister were affected, and has since been illustrated by many other cases, including Dr. Wright's, in which the grandfather, father, and a daughter of the patient were affected. The dermatosis may begin at any age, but, as a rule, it first appears in the earlier years of life. Dr. Wright's patient had had his lesions since infancy, the father's lesions had been present throughout life, and the daughter, who was 9 years of age, had had a typical lesion on her leg since infancy. Clinically porokeratosis is characterised by the occurrence of elevated wart-like lesions which, as they enlarge, form an irregular peripheral wall surrounding an atrophic depressed centre. The lesions show a distinct predilection for the hands and feet, genitals, buttocks, and scalp, although they may appear on any site. In a high percentage the mucous membranes are involved. The palms and soles almost invariably escape. Histologically the condition consists first in acanthosis and inflammatory changes in the corium, which are rapidly followed by hyperkeratosis with plugging of the sweat ducts and follicles. Except in the cases of individual lesions, which can be removed by excision or carbon dioxide, treatment is ineffectual. According to Dr. Wright porokeratosis is to be classified under the group of verrucose nævi, because of the wart-like condition of the lesions clinically, the epidermal hypertrophy as observed histologically, the familial tendency, the non-contagiousness, the persistence throughout life, the absence of inflammatory changes, the occasional systematic arrangement, and the failure to undergo involution as the result of X ray treatment.

[1] Archives of Dermatology and Syphilology, October, 1921.

YAWNING: ITS PHYSIOLOGY AND PSYCHOLOGY.

YAWNING is one of those curiously modified respiratory acts which has important physiological and psychological relations, not the least remarkable of the latter being what might almost be called its "infectious" nature, associated with imitation on the part of the beholder, and which in some people may be excited by thinking intensely of the act itself. C. Mayer in *Zeitschrift f. Biologie* (vol. lv., 1921) gives the results of his investigations in man by inspection, laryngoscopy, and X rays. The act itself he divides into three phases: 1. The initial phase, beginning with inspiration, widening of the chest, descent of the diaphragm and larynx until a certain depth of descent of both is reached, elevation of the wings of the nostrils, of the soft palate, drawing of the tongue upwards and backwards, dilatation of the rima glottidis. 2. The acme stage, full dilatation of the thorax to its greatest extent by means of the intercostal and accessory muscles, and descent of the diaphragm and larynx to their lowest position, accompanied by maximum depression of the lower jaw, further retraction of the tongue, and elevation of the soft palate. Tonic contraction of a varying number of individual muscles of the neck, shoulder, and region of the trunk. Wide lateral expansion of the mouth, closing of the eyelids, noise in the ears due to contraction of the tensor tympani, and a subjective feeling of pleasure and satisfaction. 3. Final phase, a short expiration, relaxation of the contracted muscles, ascent of the diaphragm and larynx, and elevation of the lower jaw, secretion of tears, and deglutition. The duration of the tonic contraction of the individual muscles is about 2·46 seconds, that of the whole inspiratory phase (phases 1 and 2) about 5·5 seconds. The biological significance of the acts seems to lie in the energetic ventilation of the lungs. The tonic phenomena accompanying the act can only in part be explained by the irradiation of the inspiratory impulses. This circumstance, along with the accompanying stretching of the arms and extension of the trunk, seem to indicate that the act of yawning and the participation therein of the pronounced contraction of certain muscles is of importance for aiding both the circulation and metabolism. The act itself would seem to be sub-cortical in origin, though it may be excited or discharged by psychical impulses. Spontaneous yawning is an expression of cerebral fatigue and the processes leading up to it stands in intimate relation to the function of sleep. If the optic thalamus is the part of the brain intimately concerned with sleep, then at a certain stage of fatigue the motor impulses for the act of yawning may proceed from it. In certain cases of encephalitis lethargica the execution of the act of yawning may be disturbed and modified.

A CLINIC FOR FUNCTIONAL NERVE CASES.

IT is generally recognised that progress in analytical psychology and experience gained during the war have together brought about notable advances in our methods of treatment. The Tavistock Clinic for Functional Nerve Cases was opened in September, 1920, in order to bring modern treatment for such conditions within reach of those who cannot afford specialists' fees, and to act as a centre for the study

and practice of psychotherapy. The methods employed include persuasion, suggestion, re-education, and various forms of analysis; no attempt is made to secure uniformity of method, since members of the staff may belong to different schools of thought, and, moreover, no rules can be made in the treatment of nerve cases. The aim in all cases is to restore the patient to social efficiency as quickly and as permanently as possible. Patients bringing a letter from their own doctor require no other recommendation, and pay if they can afford to do so. 219 patients have been treated during the year, involving 1784 interviews, lasting an average time of 50 minutes. Most of the cases treated in the children's department have been delinquents, chiefly thieving, and the results are said to have been uniformly good. Treatment has also been given for nocturnal enuresis and other disorders. Lectures and demonstrations are held for practitioners and medical students. A course on elementary psychotherapy is now being given by Dr. H. Crichton Miller, and during the coming year courses will be given by Dr. C. P. Symonds, Dr. J. A. Hadfield, Dr. E. W. N. Hobhouse, and Dr. W. A. Potts, who is the director of the children's department. Particulars of these courses may be obtained from the Hon. Lecture Secretary at the Clinic, 51, Tavistock-square, London, W.C. 1. While patients' fees and lecture fees go some way towards meeting the current expenses of the clinic, they are not sufficient to make it self-supporting, and help is urgently needed to enable the work to be carried on and extended.

CHEMICAL DISINFECTION AND STERILISATION.

IN a recent publication [1] Dr. S. Rideal and his son consider not only the various chemicals used as disinfectants and sterilisers, but also the details of their practical use, with some account of the experiments performed in connexion with their testing. A clear summary of the theory and technique of disinfection and sterilisation by chemical means will be welcomed by members of the medical profession as well as by numerous scientific workers.

Chemicals such as sulphur, copper, nitre, and numerous aromatic substances have been used from early times, but the number of suitable substances is now so large that a choice between them must sometimes be difficult. Moreover, the quantities of the steriliser to be employed, their times of action, as well as the best forms of apparatus for their production are of the utmost importance. Selection must depend largely on the nature of the object to be treated. Air may be sterilised by formaldehyde, sulphur dioxide, chlorine, and ozone. Chlorine is seldom used; formaldehyde and sulphur dioxide are mainly used for rooms, whilst ozone is suitable for large spaces. Chemicals used for food preservation must be chosen so as not to be injurious to health on consumption. There is thus only a limited choice, which is confined to those required for salting and smoking. Food in general is most commonly preserved by cold storage, milk by condensation and heat sterilisation. Water sterilisation is effected by filtration and sedimentation; ozone is sometimes used, but most frequently lime. Halogens as such or in the form of hypochlorites are also largely used. The destruction of non-bacterial parasites, such as insects, is another special problem; it is only successful when we know the life-history of the insect and is generally prophylactic in nature. The mode of action of the chemicals necessarily varies, being dependent not only on their own nature but on that of the object to be disinfected; physical processes such as ionisation, osmosis, surface tension play a large rôle. No specific action can be ascribed to chemical groupings in the molecule.

[1] Chemical Disinfection and Sterilisation. By Samuel Rideal, D.Sc. Lond., F.I.C., Fellow of University College, London; Public Analyst for the Metropolitan Borough of Chelsea; and Eric K. Rideal, D.Sc. Lond., M.A. Cantab., F.I.C., Fellow of Trinity Hall, Cambridge; Owen Jones Lecturer in Physical Chemistry in the University of Cambridge. London: Edward Arnold and Co. 1921. Pp. 313. 21s.

THE REACTION OF THE BLOOD: THE MECHANISM OF ITS REGULATION.

BY C. A. LOVATT EVANS, D.SC.LOND., M.R.C.S.ENG.

THE questions of the reaction of the blood and the mechanism of its regulation have attracted the attention of laboratory investigators for several years past. Numerous definite results, some of which may prove to have a practical application to clinical problems, have accrued from this originally purely academic line of investigation. Their application is, however, largely a matter for future clinical investigation to reveal. It has long been known that blood, like most other tissues, normally has a slightly alkaline reaction, which it owes to the presence in it of sodium bicarbonate. Despite the fact that the circulating blood is the receptacle of very variable amounts both of acids and bases—waste products thrown into it by the active tissues of the body—its reaction is subject to surprisingly little variation in health or even in many pathological conditions. The liver and kidneys contribute a great deal to the regulation of the reaction of the blood, and the lungs, by removing carbon dioxide, constitute a valuable fine adjustment mechanism, but a still finer means of regulation than any of these resides in the blood itself. Blood is much more than a mere carrier of oxygen, food materials, and waste products; it is a valuable means of governing the reaction of all the other tissues in the body, the relation being mutual.

The Modern Meaning of "Reaction."

Let us first consider the modern meaning of reaction without looking too deeply into the physical chemistry of the matter. The theory of electrolytic dissociation teaches that water is to a very small extent decomposed into two ions, the hydrogen-ion (H) and the hydroxyl-ion (OH), the former bearing a positive and the latter an equal negative electric charge. Further, acids when dissolved in water add hydrogen-ions thereto, whereas bases by producing hydroxyl-ions lower the hydrogen-ion content. By the reaction of a fluid is meant the concentration of hydrogen-ions in it, and this can be expressed in terms of grammes of hydrogen present in the ionic state per litre of the fluid. Water itself, the standard of neutrality, contains 1 g. equivalent (i.e., 1 g.) of hydrogen-ion in 10 million litres; it is exactly neutral because it also contains in the same volume 1 g. equivalent of hydroxyl-ion. Water, then, may be regarded as either a 10-millionth normal acid or a 10-millionth normal alkali. All acid solutions contain more and all alkaline solutions contain less than 1 g. of hydrogen-ion in 10 million litres. The concentration of hydroxyl-ion is usually disregarded, because it always varies in the opposite way to the hydrogen-ion in such a manner that the product of the two concentrations is constant for all aqueous solutions whatsoever, neither ion ever quite vanishing. A simpler way of expressing hydrogen-ion concentration is to say that pure water has a H-ion concentration of 1/10,000,000 g., or more simply 10^{-7} g. per litre. Similarly a 1/1000 normal acid has a H-ion concentration of 1/1000 g. or 10^{-3} g. per litre; while a 1/1000 normal alkali has a hydrogen-ion concentration of 1/100,000,000,000 or 10^{-11} g. per litre. Since the expression 10^{-7} means 1 divided by 10^{7} or 10,000,000 and 10^{-3} means 1 divided by 10^{3} or 1000, this way of expressing fractions is very convenient; still more convenient for the expression of hydrogen-ion concentrations is the convention of omitting the 10 and the minus sign and prefixing the letters pH, writing pH 7·0, pH 3·0, and so on. The symbol "p" means "that *power* to which 10 must be raised to give the concentration in grammes of hydrogen-ion per litre" of the fluid in question. Since it is always negative for solutions weaker than N/1 acid, the negative sign is omitted by a convention. By a further convention, H in pH stands for the hydrogen-ion, and not the element, though usually the ion is designated by H^{+}, or more simply $H^{\bullet}$. This so-called

pH nomenclature is almost universally employed at the present time for designating hydrogen-ion concentrations; it must, however, be constantly borne in mind that when the hydrogen-ion concentration of a solution—that is to say, its acidity—is increased its pH number is diminished, and vice versa; all solutions on the acid side of neutrality have a pH smaller than 7 and all alkaline solutions have a pH greater than 7. It must also be remembered that pH numbers are in reality logarithms, so that a given difference in the pH of two solutions does not represent any actual difference but only a proportional difference between their hydrogen-ion concentrations; thus the difference in hydrogen-ion concentration between pH 6·0 and 6·3 is 100 times greater than the difference between 8·0 and 8·3, though in both cases the second value is half the first (1/1,000,000; 1/2,000,000 and 1/100,000,000; 1/200,000,000 g. per litre respectively). Provided these peculiarities are borne in mind, the pH nomenclature can easily be employed by anyone without any knowledge of logarithms, and the determination of pH can be readily made by methods which are soundly based on theory, are of easy application, and require no special calculation.

Methods of Determination of pH.

The simplest of these methods is the indicator method; according to recent work it is more accurate where body fluids are concerned than more elaborate methods. It depends on the principle that certain indicators, such as neutral red or phenolsulphonephthalein, show a progressive change in colour as the pH of a solution containing them is altered, each tint being associated with a particular reaction. As it is quite easy to prepare standard solutions of known pH, all that is necessary is to find which of these standards gives the same tint as the unknown solution, when equal amounts of the indicator are added to each—in practice this is a very simple matter which need not be described in detail here. When, as with blood, the original solution is coloured, the method is slightly modified by dialysing the blood and finding the reaction of the colourless dialysate; provided that precautions are taken to prevent loss of carbon dioxide in the course of the dialysis, the dialysate has the same reaction as the blood from which it is derived, because it merely represents a diluted protein-free plasma, and it can be shown that neither moderate dilution nor removal of proteins alters the reaction of blood plasma. The exclusion of the corpuscles also has no influence, because by the reaction of blood we mean the reaction of the plasma alone; if no carbon dioxide is removed the reactions of whole blood and of the "true plasma" drawn from that blood are the same.

It would perhaps seem at first sight to be much simpler to titrate the plasma or its dialysate to a definite end-point with some chosen indicator and a standard acid and have done with the matter: to determine its alkalinity in other words. Such a procedure gives valuable information, it is true, but it tells nothing at all about the reaction of the blood; the same is true of determinations of the "alkali reserve." Both of these determinations give the bicarbonate content of the plasma, but the reaction of the plasma depends not on this alone, but also on the carbon dioxide pressure of the blood; it is, in fact, determined by the ratio between the two, the hydrogen-ion concentration varying directly as the ratio $\frac{CO_2}{NaHCO_3}$ and the pH varying as the logarithm of the ratio $\frac{NaHCO_3}{CO_2}$. The bicarbonate content of plasma may be reduced to half the normal amount, but if the carbon dioxide pressure is also half the normal, the reaction of the blood will be normal. Determination of the CO_2 of the alveolar air gives (in normal individuals at all events) some measure of the CO_2 pressure of the blood, and this, together with a knowledge of the alkali reserve, does enable one to arrive at some idea of the reaction of the blood: direct determination of the pH must, however, be regarded as far more satisfactory, and now that the technique of arterial puncture has been worked out there is no reason why it should not be made.

Buffer Substances.

The reaction of normal arterial blood is about pH 7·6, and this reaction is pretty steadily maintained under very varying conditions, owing to the presence of buffers in the blood. Buffers are substances which absorb acids without much alteration of reaction; this influence of buffers in "mopping up" acids is well seen in the case of blood plasma. Suppose one takes 10 c.cm. of blood plasma, and a similar amount of very dilute caustic soda solution of the same pH as the plasma, and adds to each solution 1 c.cm. of 1/100th normal hydrochloric acid, and, after well shaking, compares their reaction by means of indicators. It will be found that while the blood plasma has altered very little in reaction, the reaction of the soda solution has been changed to about pH 3. The principal or primary buffer of the blood plasma is its sodium bicarbonate, but whole blood is much more highly buffered even than separated plasma because, under all circumstances which tend to render the blood more acid, the corpuscles effect a counteracting change in the plasma by causing its bicarbonate content to be raised (secondary buffering); conversely, any change tending towards a more alkaline plasma leads to a reduction of its bicarbonate content by the agency of the corpuscles. We can conveniently regard the corpuscles as adding or abstracting bicarbonate to and from the plasma, though what actually happens is more complicated than that. The consequence of this action of the corpuscles is that whole blood has a most remarkable buffering power, towards both acids and alkalies; this secondary buffering of the plasma brought about by the agency of the corpuscles can best be judged from some actual figures, obtained from blood in vitro; when blood was exposed to air containing 0·13 per cent. of CO_2, the plasma contained 0·151 per cent. of $NaHCO_3$, and when saturated with air containing 12·5 per cent. CO_2 the bicarbonate of the plasma rose to 0·32 per cent.

The lower the corpuscular content of blood the smaller is the influence of this secondary buffering; anæmic blood, then, has a much smaller range of secondary buffering than normal blood; as a partial compensation for this the primary buffering of the plasma is not infrequently raised in secondary anæmias. It is more probable that the breathlessness of anæmic subjects is due to the less perfect buffering of their blood than to deficient oxygen supply, and, except in extreme cases, this applies to other states in which "air-hunger" occurs. But if in addition the oxygen supply is deficient, the condition becomes very much worse, because large amounts of fixed acids will then be thrown into the blood by the partially asphyxiated tissues, the plasma bicarbonate will be partially neutralised, and any compensation by increase of the primary buffering will thus be lost.

"Acidosis."

A little reflection on the mode of regulation of the reaction of the blood suffices to reveal a difficulty which is becoming daily more apparent; lowered bicarbonate content of the plasma by itself, or lowered alveolar carbon dioxide by itself, gives no information at all regarding the reaction of the blood; yet these are often accepted as evidence for the existence of a state called "acidosis." Nor does the plea that the term "acidosis" is justified in these cases on the ground that there is evidence that fixed acids have been formed and that these have neutralised part of the bicarbonate, carry any weight, because an increased excretion of alkali by the kidneys would also lead to a reduction in the plasma bicarbonate. A more acid state of the blood can only be inferred from such observations when we know both the carbon dioxide pressure and the bicarbonate content of the arterial blood, and the former can only be obtained from alveolar air analyses when it is

certain that there is complete equilibrium between the alveolar air and the arterial blood; this certainty is lacking in many pathological conditions. The deductions from this line of argument are important and inevitable. Firstly, that the nomenclature of the whole subject of acidosis presses for revision[1]; secondly, that alveolar air examinations are not above suspicion; and lastly, that direct determination is the only satisfactory way of finding the reaction of the blood. It may be that blood reaction will, after all, be shown to be of secondary importance—that the body can tolerate a greater variation of hydrogen-ion concentration than has been previously supposed; it may be found that the all-important factor is the bicarbonate content of the plasma, or it may be that the carbon dioxide pressure is of most consequence. But these questions can only be settled by clinical research in which all three factors—namely, the reaction, bicarbonate content, and carbon dioxide pressure of the blood are measured.

PARIS.

(FROM OUR OWN CORRESPONDENT.)

Revision of the Children Act, 1874.

THE provisions of the French Children Act, 1874, are specially designed to promote physical health of children and to reduce infantile mortality. Mr. P. Strauss, member of the French Senate, now proposes to amend and consolidate it. In Part III. of his Bill it is suggested that at the time of the notification of birth a special nursing and maintenance booklet should be provided for all children without exception. The following notes would be compulsory: (1) birth registration particulars; (2) feeding, in the case of breast-feeding not being possible, the mode of artificial feeding should be indicated; (3) periodical weight records, the periodicity being determined by a Public Health Act; (4) minutes of periodical medical examinations by family doctor, or by medical officers who act as medical inspectors under the present Children Act, who would visit free of charge the children of poor people; the results of examinations could also be recorded by the medical officers of various charitable medical institutions; (5) vaccination. At the end of the month following birth, the book would be handed over to the local authorities, and again every three months during the first year and twice a year during the second year. Each time the book would be produced a visa would be apposed. If at any time the reading of the book shows that the child has not been under the regular medical attendance of a family doctor or under the supervision of a public or private institution, the local authorities will report the fact to the county medical inspector whose duty it will be to have the child medically examined. In the case of a second offence, the county medical inspector, after referring the fact to a special local commission, will have the privilege to have the child admitted to any special institution for the protection of infants. In the event of the parents protesting against such a decision, the county council authorities will enact without appeal, acording to the results of the inquest of the justice of peace. This proposed amendment to the Children Act has aroused great interest in medical and political circles over here.

Mental Diseases and Syphilis.

The Comité de la Propagande d'Hygiène et d'Education Prophylactique, with a view to publishing statistics of the connexion between syphilis and various psychoses as well as neuroses decidedly allied to general paralysis of the insane, proposes to open an investigation especially amongst medical officers in charge of asylums and physicians who are specialised is the study of mental diseases. The investigation is made from both a prophylactic and therapeutic point of view. Physicians will be asked to detail their observations as follows:—(1) Mental diseases caused by acquired syphilis: (*a*) mental conditions caused by syphilis alone and occurring together with other syphilitic stigmata; (*b*) mental diseases caused by syphilis and associated with psychopathic inheritance; (*c*) pathological findings in repeated lumbar punctures in cases of syphilis, and more especially in those complicated with tabes and encephalitis. 2. Mental disorders in cases of inherited syphilis, abnormal infancy, idiocy, epilepsy. 3. Frequency of mental disorders of syphilitic origin: (*a*) any personal statistics recording the frequency of mental disorders amongst syphilitics, as well as statistics giving the number of cases of mental disorders due to syphilis amongst any group of patients treated for all kinds of psychoses; (*b*) statistics showing the importance of the factor syphilis proportionally to the other causes of insanity (alcoholism, over-work, &c.); (*c*) the results of the routine use of the Wassermann reaction and of the cytological examination of the cerebro-spinal fluid of patients interned in various asylums. 4. Therapeutic results: statistics of results obtained by routine prolonged treatment with mercurial compounds and novarsenobenzol and similar drugs in various cases of mental disorders in which syphilis has been or has not been detected.

Paris Physicians and Surgeons at Strasbourg.

The fifteenth French Congress of Medicine, the thirtieth French Congress of Surgery, the twenty-first French Congress of Urology, and the third annual meeting of the Société Française d'Orthopédie were held at Strasbourg from Oct. 3rd to 8th. Amongst the congressists were some of the leading Paris physicians and surgeons. Prof. F. Widal, Mr. P. Abrami, and Mr. Pasteur Valery-Radot gave their views on anti-anaphylaxis; MM. L. Ambard and H. Chabanier reported on glycæmia; Mr. C. Lenormant, with Mr. H. Billet, described the results of the treatment of epilepsy consecutive to cranial traumatisms; MM. M. Chevassu and F. Rattery reported their views on anæsthesia in urinary surgery; Mr. L. Ombredanne reviewed various arthrodeses performed on the lower extremity.

Oct. 9th.

BUDAPEST.

(FROM OUR OWN CORRESPONDENT.)

Reform of Nutrition and Alcohol Consumption.

IN a recent lecture Dr. Dóczy, President of the Hungarian Order of Good Templars, said that according to his own experience and that of other investigators, the largely vegetable type of diet now customary in Hungary has lessened the desire for alcoholic drinks. The principles of modern nutrition, application of which resulted from the war scarcity of food, have great economic advantages; many people are both spending less on food and becoming capable of better work. The supplying of food to the army has also become much cheaper.

Infant Welfare in Budapest.

The Society for the Promotion of Infant Welfare has under consideration the adoption of the welfare scheme in force at Lübeck (Germany), the main provisions of which are as follows: Care of children is a duty of the State; all illegitimate children must be brought up under medical supervision; infants' homes are placed in charge of Roman Catholic sisters; notification of births of illegitimate children is a duty of midwives, and the sisters thereupon call at the mother's dwelling. When a birth is reported, pamphlets are issued to the mother, which contain information concerning the care of infants, together with a list of the infants' homes. The medical staffs of infants' homes are paid by the State.

Duties of Medical Men in Bulgaria.

For two years Bulgaria has been ruled by a peasant Government, and the new law by which everyone in

[1] The need for a revision was definitely expressed in the course of a discussion on Acidosis at the 1920 meeting of the B.M.A.

the country is compelled to work until his sixty-fifth year has given a great deal of trouble to medical men, who find themselves expected to estimate the working capacity of thousands of would-be idlers. Moreover, the stringent sumptuary laws include such provisions as the following: payment of a tax of 200 leva by anyone, irrespective of age or sex, who wears gloves between April 15th and Sept. 16th without a medical certificate to prove that the gloves are indispensable for purposes of health; payment of a tax of 100 leva by anyone of less than 50 years of age who carries a walking-stick without a medical certificate entitling him to do so. Bulgarian doctors now make out more certificates in a week than they have hitherto been used to making out in two or three years, and are apparently well paid for so doing.

A "Dental" Swindle.

An original form of swindle was recently perpetrated by a youth who opened a "dental surgery" at Temesvar, and by advertising a scale of charges half that of any other dentist in the town, drew large crowds to his waiting room. He examined each patient, and if the person had gold crowns or stoppings he removed the latter, describing them as badly-fitting and in need of replacement. He then took a wax model and ordered the patient to return in a fortnight's time. In a fortnight he collected about half a kilogramme of gold with which he attempted to leave the country. He was arrested in the train, however, and brought back to Temesvar. Here it was ascertained that he was in reality a grocer's clerk, who had learned sufficient dentistry from a friend, a dentist's assistant, to enable him to put his fraud into operation.

Village Riot on a Doctor's Behalf.

In a Hungarian village the head of the registry office complained to a detective that in six months only one birth occurred in the village, where in former years the birth-rate varied between 65 and 80 yearly. The detective set to work, with the result that the village doctor, Dr. N. Somogyi, was taken in custody on the charge of having induced abortion in several hundreds of cases. Thereupon the village people, with whom the doctor was very popular, rioted and demanded his immediate release. However, on searching his house, the police found a long list containing the names of hundreds of women, and the fees they paid. The list contained among many modest sums some very considerable amounts—items of from 3000 to 10,000 crowns. An investigation was then opened amongst the women too, and it was found that some of them had burned fœtuses in a bread-baking oven. The investigation also made it plain that many husbands knew of the abortions. Dr. Somogyi defended himself by saying that he did not induce abortion, but only helped to finish the abortions already commenced. He wanted to pay into court 100,000 crowns security to be set free until his trial, but the jury refused to comply with his request.

Prosecution of a Charlatan.

An interesting judgment was recently delivered against a quack in a Hungarian court of law. A patient, advised by his medical man to have an operation performed for extensive hæmorrhoids, thought fit to consult a well-known unqualified "doctor," who gave an opinion contrary to that of the surgeon, and supplied some ointment and lotion, with the result that gangrene and proctitis set in; the patient returned to the surgeon, who performed the operation. The after-treatment lasted over three months, during which time the patient's life was endangered by the threat of sepsis. The patient sued the charlatan for damages and also tried to recover the fees he had paid. He did not get his money, and the judge, in sentencing the defendant to six weeks' imprisonment, made it plain that the punishment was not for quackery, but for preventing the complainant from following sound advice.

Oct. 6th.

CANADA.

(FROM OUR OWN CORRESPONDENT.)

University of Toronto.

THE Medical School has limited registration this fall to 110 persons, one-half the total number of applications, on account of lack of facilities for handling them. These, with the students who are repeating the first year on probation, comprise the first year in medicine. Selection of the successful candidates was made on the basis that first preference should be given to returned soldiers with the necessary qualifications; students who had obtained standing of a higher grade than junior matriculation were in the next group, and the third group consisted of students with junior matriculation over 19 years of age. Applications were restricted to the province. This decision to restrict registration was forced upon the authorities by reason of the increase of medical students. The present register contains 1106 names, while in 1918 it contained only 656. This university's registration in this department is the largest on the continent.

Ontario Medical Association.

A district meeting of the Ontario Medical Association was recently held at Peterboro', Ont., at which Dr. T. C. Routley, the secretary, gave an address on "Organisation Progress in Ontario and Other Provinces." He recapitulated the work of the Association and laid particular emphasis upon the need for proper standardisation of drugs and the necessity of informing the public as to what constituted competency on the part of all who undertook to treat the sick. The meeting was attended by many practitioners of Peterboro', Victoria, Durham, Northumberland, Hastings, Prince Edward and Haliburton counties. Interesting papers were presented during the afternoon session and prompted fruitful discussions. At the evening session Dr. F. W. Marlow, of Toronto, gave an address on "Symptomatology and Treatment of Some Gynæcological Conditions."

Drugless Healing and Chiropractic Bills in British Columbia.

A legislative committee was recently appointed to collect evidence for and against the Drugless Healing and Chiropractic Bills and has recently issued a report. The committee states that the question it had to decide was whether the chiropractors and the drugless healers had made out a case for an alteration of the present law, so that they might be permitted to practise the art of healing without hindrance. After receiving evidence from many prominent chiropractors, the committee recommended these should be allowed to continue their practice, but that suitable examinations should be set by the Medical Council, in order to secure competency on the part of chiropractors, &c., before they were allowed to establish a practice. The committee also suggested that the Medical Act be amended to include these provisions.

A New Tuberculosis Examiner.

Dr. T. M. Sieniewicz, of Halifax, Nova Scotia, for three and a half years associated with Dr. A. F. Miller in the Tuberculosis Sanatorium in Kentville, N.S., has been appointed to the position of Tuberculosis Examiner in the Massachusetts-Halifax Health Commission. Dr. Sieniewicz succeeds Dr. D. A. Craig, the first to hold this position. All of his time will be given to the Public Health work of the Commission, and to consultation work with physicians of Halifax and Dartmouth.

Hospital News.

A by-law is to be submitted to the electors of St. Thomas, Ont., authorising an issue of $100,000 in debentures for the erection of the proposed memorial hospital in connexion with the Amasa Wood Hospital. An expenditure of $160,000 is estimated for, $60,000 of which is to be raised by private subscription. It is proposed to erect a

new sanatorium on the site of the old Delmonte Hotel buildings on the top of the hill at Preston, Ont. When the new sanatorium is completed it is expected to eclipse any other in this country and to rival institutions at Clifton Springs and other famous United States health resorts. The new sanatorium will command a magnificent view of the town of Preston and the surrounding country. Recently at Oshawa, Ont., a campaign was launched to raise money for the National Sanatorium Million Dollar Fund. Many prominent representative men from this locality were present at the meeting, amongst whom were Dr. T. W. G. MacKay, of Oshawa, and Dr. Kendall, superintendent of the Muskoka Free Hospital.

Oct. 4th.

Public Health Services.

REPORTS OF MEDICAL OFFICERS OF HEALTH.

EDINBURGH.

THE estimated population for 1920 was 336,923; the birth-rate (corrected for country births), 23·1; the death-rate, 13·2; the infant mortality rate, 80; the phthisis death-rate, 0·84; and the total tuberculosis death-rate, 1·21. Dr. A. M. Williamson draws attention to unsatisfactory housing conditions, and to the facts that for some years only the "very minimum" of repairs has been done to the property occupied by the poorest section of the population, and that 37 per cent. of the population live in houses consisting of one or two rooms. Cancer caused more deaths than all forms of tuberculosis. The tuberculosis death-rate, 1·2, though not a low one, is the lowest on record for Edinburgh. The chart showing the decline in the phthisis death-rate since 1873 in Scotland and Edinburgh respectively is an interesting one. The decline in Edinburgh has not been retarded by the war, and has, in fact, been more rapid since the outbreak of war than previously, while the Scottish curve shows the effect of the war. Edinburgh certainly, and perhaps Scotland as a whole, fared better than most parts of England in the matter of food during the war years. Probably, too, there was less strenuous factory work in Edinburgh than in the south. The Glasgow small-pox outbreak gave a stimulus to vaccination in Edinburgh, and Dr. Williamson estimates that over 80,000 persons were successfully vaccinated or revaccinated. The occurrence of two cases of small-pox in Craiglockhart Poor House was alarming. About 900 inmates were vaccinated, and the outbreak was limited to six modified cases among the contacts. The maternity and child welfare scheme is a very comprehensive one, and includes ante-natal clinics, preventive and curative clinics, mostly held at the dispensaries, day nurseries, child gardens, and convalescent homes. Dr. Williamson considers that the lack of medical attendance at their homes for children who cannot be brought up to the centre is a weak point in the scheme. Sixty-six cases of ophthalmia neonatorum were notified. We learn that one case died in hospital, but that six others were discharged with the eyes in a satisfactory condition. (Information as to the extent of eye damage among the home-treated cases would have been of interest.) The venereal diseases scheme is far-reaching and satisfactory, and good work in the treatment of infected expectant mothers is being carried out at the Royal Maternity Hospital. Dr. Williamson is alive to the weak points in the scheme. The lowest class of sufferers, "who are utterly careless of themselves and of others," need not and do not attend the clinics. Again, in a very considerable number of cases the first visit to the clinic proves to be the last. Dr. D. Lees, the clinical V.D. medical officer, is emphatic that something must be done with regard to the 30 to 40 per cent. who fail to continue attendance for a sufficiently long period. The report of the veterinary inspector, Mr. Gofton, shows that there are about 1605 cows stalled in the city. Twenty-seven were removed from dairy byres during the year on account of tuberculosis. Of these 18 were affected with tuberculosis of the udder, 8 were the subjects of advanced clinical tuberculosis with emaciation, and the remaining one was eliminating tubercl ebacilli in the milk. Mr. Gofton points out that since the local authority has no power to require slaughter in these cases, there is no guarantee that the milk of these cows is not used after they are turned out of the city byres. In nine cases the cow is known to have been slaughtered. Two large dairy herds are now free from tuberculosis, and others are in course of being cleared.

STOCKPORT.

The estimated population for 1920 was 130,635. The birth-rate, which was 13·84 in 1918 and 15·05 in 1919, rose in 1920 to 22·2. The death-rate was 12·87, the lowest ever recorded. The infant mortality rate was 97, and the death-rates from phthisis and other forms of tuberculosis were 0·94 and 0·24 respectively. Dr. H. E. Corbin tells us that both scarlet fever and diphtheria were epidemic in the town during the year, both in mild form. At the last census there were 5436 female cotton operatives, of whom 2236 were married, and 1584 females employed in the hat and cap trades, of whom 277 were married. The number of still-births known was 154—i.e., 5·3 per cent. of the live births. The infant mortality rate for legitimate children was 93, and for illegitimate children 188. There are still 1188 privy ashpits, with 2074 privies to be converted. The work of converting them has been resumed, 32 having been dealt with in 1919 and 328 in 1920. High prices have retarded progress. Under the heading "milk-supply," Dr. Corbin says: "A sterilised milk depôt was established in the town as a private undertaking during the year. This depôt has already a very large daily delivery of sterilised milk, either directly to the consumer or through the milk vendors. It is under the supervision of the local authority, and the samples which have been analysed, both chemically and bacteriologically, were found to be satisfactory." This development will be watched with interest. Dr. Corbin points out that only about half the children born are successfully vaccinated. Stockport showed no increase of tuberculosis during the war, perhaps because the women were already largely employed in the mills. At the beginning of the year a centre was opened at the borough dispensary for the free treatment of venereal diseases. Stockport patients also used the Manchester centres. The first municipal maternity and child welfare centre was opened in August, and a rota of voluntary workers, largely members of 60th Cheshire V.A.D., has been formed to assist in the work. Of 65 cases of ophthalmia neonatorum notified, 51 were treated successfully by the health visitors acting under the instructions of the medical attendant. Six cases had eventually to be sent to the Manchester Royal Eye Hospital. In how many cases ultimate damage to eyesight ensued is not recorded. By agreement with Hyde Corporation four beds are retained at the Hyde Small-pox Hospital for Stockport patients, so that in the event of an outbreak the first few cases could be treated without disturbance of the tuberculosis patients accommodated at the Stockport Small-pox Hospital.

COVENTRY.

The population of Coventry has increased very rapidly. In 1901 it was 70,300, and for 1920 the estimated population is 140,000. According to Dr. E. H. Snell, with the exception of sandblasting, none of the occupations followed can be described as specially injurious. The birth-rate for 1920 was 23·2, compared with 18·2 for 1919. The death-rate, 9·0, was the lowest on record. The infant mortality rate was 76. The phthisis death-rate was 0·91, and

the rate from other forms of tuberculosis 0·22. The increase in the tuberculosis death-rate during the war years was less marked than in many towns, but the decline in the rate since the war ended has been marked. A Bill is being promoted in Parliament for the purchase of the North Warwickshire Water Co. The sewage is dealth with partly on a sewage farm and partly by means of filter-beds, which are being extended. The treatment by activated sludge, which is proving so successful elsewhere, is not apparently being adopted for the extensions. The council have declared fried-fish shops an offensive trade, and have adopted the novel principle of hearing the opinion of the tenants within a radius of 100 feet before sanctioning the establishment of a fish shop. The principle seems a good one, but the distance of 100 feet does not err on the generous side. Dr. Snell gives figures showing that the community is becoming largely an unvaccinated one. A case of malignant pustule, traced to a shaving brush infected with anthrax, recovered. Of 160 deaths from tuberculosis, no less than 28 died unnotified. For the purpose of institutional and dispensary treatment the city is united with Warwickshire by a Local Government Board Order. An X ray apparatus has been installed at the dispensary since January, 1920, and has been used extensively for diagnostic purposes. Considerable attention is being given to the dental treatment of tuberculous patients. There were 280 new cases of venereal disease treated at the clinic; 49 cases ceased attendance before completing a course of treatment. One hundred and nine cases of suspected ophthalmia neonatorum were notified, the midwives being encouraged to notify the slightest discharge. Of these 105 are said to have made a total recovery; two died before recovery was complete, one infant is said to have had one eye permanently injured, and one to be totally blind in one eye. None of these cases were nursed in hospital. Dr. Snell submits a complete report as school medical officer. There are now two assistant school medical officers, two dentists, and five nurses. An interesting account is given of the work of Corley Camp residential open-air school, which has accommodation for 16 children. An open-air day school for physically defective children is held on the flat roof of Centaur-road School, which is visited by the organiser of physical training to advise the teachers with regard to special exercises. Of 1935 children referred for dental treatment, 1129 accepted treatment.

SCHOOL MEDICAL SERVICE.

MANCHESTER.

Dr. A. Brown Ritchie, school medical officer of the city, has just issued the twelfth annual report, dealing with the year 1920. Besides the chief assistant medical officer, there is a staff of 15 medical officers, three specialist officers (anæsthetist, surgeon, and consulting oculist), all on part-time duty, five school dentists (two on part-time duty), and 48 school nurses. In addition there are two masseuses and two nurse-attendants, and one remedial gymnast for the Lancastrian Day School for Crippled Children. Even with this not inadequate staff it cannot be maintained that each child requiring special treatment could receive it. There are only four dental clinics, which deal with 20,000 children out of the school population of 123,000, and another school clinic is urgently needed. There are no open-air day schools, nor can the present arrangement for educating and treating mentally defectives, crippled children, and partially blind children be in any way considered adequate. But the benefits accruing from school medical work become more marked year by year. There were 128,180 examinations by medical men, including 40,997 during medical inspections of schools, 84,195 at school clinics, and 2988 examinations of mentally defectives and epileptics. The school dentists examined 19,669 children at school and treated 17,758 at school clinics. Nurses paid 15,647 visits to homes and schools, and there were 202,774 special inspections for verminous conditions. The Danish treatment of scabies and the preparation and composition of the ointment (Marcussen) used are fully described. There are four special schools for mentally defective children; 305 children certified as feeble-minded attended ordinary schools, and 154 more were not attending any school. Five courses were held during 1920 for stammerers. Each course was restricted to a class of 10, and the total number who attended courses during the year was 46. For the majority of the cases one complete course of six to seven weeks was found sufficient for a satisfactory result, but the children are encouraged to attend on Saturday mornings for some time after the course is finished. In 15 of the stammering children (13 boys and two girls) there was evidence of other members of the family having stammered, and in one of the three cases with defective articulation a similar condition was reported in a parent. In 15 cases the condition was reported to have existed from the commencement of speech, and in 23 it was of later development. Body spasms of greater or less degree accompanied the stammer in 17 boys and three girls. The association of the stammering with general nervousness or a marked neurotic condition was frequently noticed. The results may be classified as 19 very good, 18 satisfactory, 7 fair, and 1 poor. In the tonsil and adenoid clinic—which is provided with an anæsthetic room, an operating theatre, and a ward of six beds—there were 1157 examinations and 925 operations. On operating days the patients are brought to the clinic and put to bed for an hour or more beforehand, during which time an injection of atropine gr. 1/100 is given to eliminate salivation as far as possible. Dr. H. Herd adds to Dr. Ritchie's report some interesting observations on "intelligence tests" based on the Stanford revision of the Binet tests. The Stanford revision seems to be more applicable to English children than either the Binet or Goddard revision. It was noted from the use of such tests as "repetition of digits," the æsthetic test (comparison of ugly and pretty faces), drawing square and diamond from copy, "fingers on hand test," &c., that the growth of mental faculty is not steady from year to year. It has rapid and slow periods, just as physical growth has, and in addition to that different capacities do not grow together in anything like equal amounts in any given period. This irregularity is more noticeable among the defective than among the normal.

CARDIGANSHIRE.

In 1919 Dr. Meredith Davies outlined a scheme for the prevention and amelioration of disease in the children of Cardiganshire. It is unfortunate and disappointing that nothing further seems to have been done in this direction; indeed, the report for 1920 is depressing reading. Out of 2181 children submitted to routine inspection, 345 were found suffering from malnutrition, 329 from defective vision, 540 from nose and throat disease, 1831 from dental disease, 162 from suspected and eight from definite pulmonary tuberculosis, and 203 from deformities. No cases of ringworm of the head were found, and only three of body ringworm. Only 350 children were free from dental disease; of the remainder 31 were found on re-examination to have been treated. One hundred and fifty-three cases of visual defect, and 32 cases of nose and throat troubles were treated. In spite of the large amount of malnutrition, there is no provision for feeding children, although a complete scheme was drawn up by Dr. Davies. Examination of secondary school children is impossible owing to the shortage of staff. The report consists of a series of negations; the school medical officer gets no help from any voluntary agency; there are no minor ailment centres; no provision for dental treatment, or for tuberculosis, or for eye and ear disease has been made, but an arrangement has been come to with the infirmary at Aberystwyth for the treatment of enlarged tonsils and

adenoids. One hundred and thirty children were found to be dull and backward, and for these also no provision has been made. An open-air school is greatly needed in the county. Dr. Davies finds that although school closure is of very little use in the prevention of infectious disease, the fact that teachers are paid according to the average attendance is an inducement to them to desire school closure. It is unfortunate that so much lethargy in regard to health matters prevails in the county, and that the school medical service is subjected to such severe restrictions.

HYDE.

Out of 2056 children examined, 1747 suffered from dental defects, 267 from non-tuberculous lung trouble, three from definite pulmonary tuberculosis, 348 from nose and throat diseases, including 87 cases of enlarged tonsils and adenoids. Dental treatment was received by 116 children, while 16 cases of nose and throat troubles were treated under the authority's new scheme. Of 1363 cases of minor ailments, which received treatment, the majority consisted of impetiginous and other skin affections. The clinic is open for two hours daily, excluding Saturdays, and Dr. C. S. Thomson has arranged for all children suffering from bronchial catarrh to be seen weekly. Where medicine is required the child is sent to the family doctor. Twenty per cent. of the children had dirty heads; this appears a high percentage, but it must be remembered that the same standard of cleanliness is not accepted by all authorities. If school nursing was thoroughly carried out the numbers could be reduced considerably. The report shows at least 50 children with crippling defects, and Dr. Thomson suggests the formation of a guild of help to deal with these cases. An earnest endeavour is being made to raise the hygienic standard in this borough.

VITAL STATISTICS OF LONDON
DURING SEPTEMBER, 1921.

IN the accompanying table will be found summarised statistics relating to sickness and mortality in the City of London and in each of the metropolitan boroughs. With regard to the notified cases of infectious disease it appears that the number of persons reported to be suffering from one or other of the ten diseases notified in the table was equal to an annual rate of 14·0 per 1000 of the population, estimated at 4,531,971 persons in the middle of 1920; in the three preceding months the rates had been 9·4, 10·3, and 8·5 per 1000. Among the metropolitan boroughs the lowest rates from these diseases were recorded in Chelsea, St. Marylebone, Lambeth, Wandsworth, Deptford, and Lewisham; and the highest in Hackney, Finsbury, Shoreditch, Bethnal Green, Stepney, Poplar, and Bermondsey. The prevalence of enteric fever was nearly a third greater than in the preceding month; of the 45 cases notified during the four weeks ended Oct. 1st, 8 cases belonged to Wandsworth, 6 to Poplar, 5 to St. Marylebone, 4 to Kensington, and 3 to Camberwell. There were 37 cases of enteric fever under treatment in the Metropolitan Asylums Hospitals at the end of the month, against 23, 27, and 32 at the end of the three preceding months; the weekly admissions averaged 7, against 4, 5, and 5 in the three preceding months. The prevalence of scarlet fever showed a marked increase over the previous month—76 per cent.—and was considerably higher than in any preceding month since November, 1920; this disease was proportionally most prevalent in Hackney, Finsbury, Shoreditch, Bethnal Green, Stepney, Poplar, and Bermondsey. The Metropolitan Asylums Hospitals contained 4847 scarlet fever patients at the end of the month, against 3621, 3722, and 3408 at the end of the three preceding months; the weekly admissions averaged 840, against 506, 567, and 467 in the three preceding months. Diphtheria also was considerably more prevalent—53 per cent.—than in August, and was about equal to the average of the first three months of the year; the greatest proportional prevalence of this disease occurred in Hampstead, Hackney, Holborn, Shoreditch, Stepney, Bermondsey, and Greenwich. The number of diphtheria patients under treatment in the Metropolitan Asylums

ANALYSIS OF SICKNESS AND MORTALITY STATISTICS IN LONDON DURING SEPTEMBER, 1921.

(Specially compiled for THE LANCET.)

CITIES AND BOROUGHS.	Estimated civil population, 1920.	Notified Cases of Infectious Disease.												Deaths from Principal Infectious Diseases.									Deaths from all causes.	Death-rate per 1000 living.
		Enteric fever.	Other continued fevers.	Small-pox.	Scarlet fever.	Diphtheria.*	Erysipelas.	Poliomyelitis and polioencephalitis.	Encephalitis lethargica.	Cerebro-spinal fever.	Puerperal fever.	Total.	Annual rate per 1000 persons living.	Enteric fever.	Small-pox.	Measles.	Scarlet fever.	Whooping-cough.	Diphtheria.*	Diarrhœa and enteritis (under 2 years).	Total.	Annual rate per 1000 persons living.		
LONDON	4,531,971	45	—	—	3314	1284	170	10	5	5	23	4856	14·0	7	—	3	17	50	73	479	629	1·8	3788	10·9
West:																								
Paddington ...	149,673	1	—	—	97	26	11	—	—	—	—	135	11·8	—	—	—	—	3	1	16	20	1·7	118	10·3
Kensington... ...	164,177	4	—	—	108	27	4	—	—	—	—	143	11·4	—	—	—	—	1	1	25	27	2·1	137	10·9
Hammersmith...	136,200	1	—	—	128	24	6	—	—	—	—	159	15·2	—	—	—	1	1	—	15	17	1·6	113	10·8
Fulham	158,621	—	—	—	82	38	7	2	—	—	3	132	10·8	—	—	—	1	4	2	17	24	2·0	141	11·6
Chelsea	62,987	—	—	—	16	22	—	1	—	—	—	39	8·1	—	—	—	1	1	1	4	7	1·4	50	10·3
City of Westmin'r	132,615	2	—	—	104	25	3	—	—	—	—	134	13·2	1	—	—	—	1	3	11	16	1·6	115	11·3
North:																								
St. Marylebone...	101,856	5	—	—	56	13	5	—	—	1	1	81	10·4	1	—	—	1	—	3	4	9	1·2	82	10·5
Hampstead ...	91,519	1	—	—	39	44	2	—	—	—	—	86	12·2	—	—	—	1	—	5	2	8	1·1	51	7·3
St. Pancras... ...	228,178	—	—	—	181	78	3	1	1	—	1	265	15·1	1	—	—	—	1	4	28	34	1·9	169	9·7
Islington	335,907	1	—	—	316	98	18	—	1	—	2	436	16·9	—	—	—	—	3	4	43	50	1·9	294	11·4
Stoke Newington	52,984	—	—	—	43	8	1	1	—	—	—	53	13·0	1	—	—	—	—	1	4	6	1·5	41	10·1
Hackney	225,372	—	—	—	220	97	8	—	—	—	—	325	18·8	1	—	—	2	4	—	22	29	1·7	206	11·9
Central:																								
Holborn	39,676	1	—	—	24	21	2	1	—	—	—	49	16·1	—	—	—	1	—	—	1	2	0·7	32	10·5
Finsbury	78,291	—	—	—	78	30	5	—	—	1	—	114	18·9	—	—	—	1	—	3	8	12	2·0	82	13·7
City of London...	14,447	1	—	—	8	5	—	—	—	—	—	14	12·6	—	—	—	—	—	1	1	2	1·8	12	10·8
East:																								
Shoreditch	102,044	—	—	—	98	46	8	—	—	—	—	152	19·4	—	—	—	—	1	2	29	32	4·1	106	13·5
Bethnal Green ...	114,471	—	—	—	137	36	11	—	1	—	1	186	21·2	—	—	1	—	1	2	21	25	2·8	107	12·2
Stepney	241,770	2	—	—	243	110	13	—	—	—	1	369	19·9	—	—	—	1	6	5	38	50	2·7	223	12·0
Poplar	159,766	6	—	—	153	62	9	—	—	—	2	232	18·9	—	—	2	1	5	4	15	27	2·2	145	11·8
South:																								
Southwark	187,142	—	—	—	107	48	9	1	—	1	2	168	11·7	—	—	—	—	4	1	36	41	2·9	202	14·1
Bermondsey ...	129,189	2	—	—	132	66	2	—	—	—	—	202	20·4	—	—	—	1	1	6	16	24	2·4	116	11·7
Lambeth	293,572	2	—	—	139	50	4	—	1	1	2	199	8·8	—	—	—	1	3	4	30	38	1·7	249	11·1
Battersea	165,664	1	—	—	136	62	3	—	1	1	4	208	16·4	—	—	—	1	2	8	13	24	1·9	147	11·6
Wandsworth ...	346,990	8	—	—	168	54	11	—	—	—	1	242	9·1	1	—	—	—	1	2	20	24	0·9	195	7·3
Camberwell ...	284,712	3	—	—	188	60	12	—	—	—	1	264	12·1	1	—	—	—	2	4	27	34	1·6	252	11·5
Deptford	115,636	—	—	—	67	14	3	1	—	—	1	86	9·7	—	—	—	1	5	—	9	15	1·7	94	10·6
Greenwich	102,408	1	—	—	83	44	5	1	—	—	—	134	17·1	—	—	—	1	—	2	4	7	0·9	70	8·9
Lewisham	174,438	1	—	—	71	39	3	1	—	—	1	116	8·7	—	—	—	—	—	1	9	10	0·7	131	9·8
Woolwich	141,666	2	—	—	92	37	2	—	—	—	—	133	12·2	—	—	—	1	—	3	11	15	1·4	108	9·9

* Including membranous croup.

Hospitals, which had been 1896, 1969, and 1709 at the end of the three preceding months, rose to 2031 at the end of September; the weekly admissions averaged 322, against 235, 250, and 209 at the end of the three preceding months. Erysipelas was proportionally most prevalent in Paddington, Islington, Finsbury, Shoreditch, Bethnal Green, Stepney, and Poplar. Of the 10 cases of poliomyelitis or polioencephalitis 2 belonged to Fulham. Five cases of encephalitis lethargica were notified during the month, against 10, 9, and 5 in the three preceding months. The notified cases of cerebro-spinal fever numbered 5, against 5, 7, and 9 in the three preceding months. The 23 cases of puerperal fever included 4 in Battersea, 3 in Fulham, and 2 each in Islington, Poplar, Southwark, and Lambeth. The mortality statistics in the table relate to the deaths of civilians actually belonging to the several boroughs, the deaths occurring in institutions having been distributed among the boroughs in which the deceased persons had previously resided. During the four weeks ended Oct. 1st, the deaths of 3788 London residents were registered, equal to an annual rate of 10·9 per 1000; in the three preceding months the rates had been 9·4, 9·8, and 10·6 per 1000. The death-rates ranged from 7·3 in Hampstead and in Wandsworth, 8·9 in Greenwich, 9·7 in St. Pancras, 9·8 in Lewisham, and 9·9 in Woolwich, to 11·9 in Hackney, 12·0 in Stepney, 12·2 in Bethnal Green, 13·5 in Shoreditch, 13·7 in Finsbury, and 14·1 in Southwark. The 3788 deaths from all causes included 629 which were referred to the principal infectious diseases; of these, 7 deaths resulted from enteric fever, 3 from measles, 17 from scarlet fever, 50 from whooping-cough, 73 from diphtheria, and 479 from diarrhœa and enteritis among children under 2 years of age. Among the metropolitan boroughs the lowest death-rates from these diseases were recorded in St. Marylebone, Hampstead, Holborn, Wandsworth, Greenwich, and Lewisham; and the highest in Shoreditch, Bethnal Green, Stepney, Poplar, Southwark, and Bermondsey. The 7 fatal cases of enteric fever exceeded the average in the corresponding period of the five preceding years by 2. The 3 deaths from measles were 19 below the average; 2 of these deaths belonged to Poplar, and the remaining 1 to Bethnal Green. The 17 fatal cases of scarlet fever were 7 in excess of the average; of these, 2 belonged to Hackney. The 50 deaths from whooping-cough were 27 above the average; the greatest proportional mortality from this disease occurred in Paddington, Fulham, Stepney, Poplar, Southwark, and Deptford. The 73 fatal cases of diphtheria exceeded the average by 33; this disease was proportionally most fatal in St. Marylebone, Hampstead, Finsbury, the City of London, Poplar, Bermondsey, and Battersea. The deaths from infantile diarrhœa numbered 479, and exceeded the average by 171. This is the largest number of deaths from infantile diarrhœa recorded in London in September since the corresponding period of 1915, when they numbered 739; the greatest proportional mortality from this disease occurered in Kensington, Shoreditch, Bethnal Green, Stepney, and Southwark. The aggregate mortality in London during September from these principal infectious diseases was 54 per cent. above the average.

The deaths from influenza registered in London during the month numbered 21, against 30, 15, and 9 in the three preceding months, and an average of 23 in the corresponding period of the five preceding years.

BIRMINGHAM CRIPPLES' UNION NEW CONVALESCENT SCHOOL.—On Oct. 5th The Forelands, Bromsgrove, was formally opened by the Lord Mayor as a convalescent school for crippled children. A spacious mansion, beautifully situated, has been well adapted for accommodating 80 children. There are two open-air dormitories, with large schoolroom and dining-room, and every provision for open-air treatment. Education up to ordinary standards will be combined with gardening, manual instruction, poultry keeping, &c. This enterprise, made possible by an appeal through the *Birmingham Mail* which raised £15,000, marked the consummation of 25 years' work in Birmingham on behalf of crippled children. The Cripples' Union was founded to link up existing organisations, but it was soon found that these were inadequate and the Union itself undertook to make the necessary provision. There is now an admirable system of home visiting with an out-patient clinic, an organisation for "after-care" work, the Woodlands Surgical and Nursing Home, and finally the new convalescent school, a pioneer institution. In addition to the £15,000 a grant has been obtained from the Ministry of Health and the school was opened free from debt. Its maintenance will cost from £5000 to £7000 a year. Mr. Naughton Dunn and Mr. Wilson Stuart are to act as surgeons to the Union, and Dr. Rowlands, of Bromsgrove, will be visiting medical officer.

Correspondence.

"Audi alteram partem."

THE REDUCTION OF THE CAPITATION FEE.

To the Editor of THE LANCET.

SIR,—It is not without some feeling of shame that members of the medical profession will note on reading the report of the Minister of Health's reply to a deputation of the British Medical Association concerning the reduction of the panel capitation fee that he had occasion to remark, "I told you I was not going to haggle about this thing, and I am not." Well one may ask what provoked this retort, so little befitting negotiations between a Minister and a deputation of medical men, and the answer appears to be that the latter attempted by argument to save a few pence of the impending reduction.

Great publicity has been given to what is represented as the fighting attitude of the profession regarding this matter, and perhaps it is well that the view held by no inconsiderable section of the profession of medicine should be stated also. In his reply to the memorandum forwarded by the Federation of Medical and Allied Societies on Oct. 4th (published in your issue of Oct. 8th), the Minister states his appreciation of the grounds on which the Federation supports an inquiry into the National Health Insurance system and that he has under careful consideration the question of setting such an inquiry on foot. He states also that the financial condition of the country necessitates such reduction of the insurance practitioner's fee as is fair to both the country and the medical profession. He has announced now that the inquiry, originally asked for by the Federation in January, 1920, is going to be held, that it must cover all the ground and must be without prejudice.

Practitioners on the panel are informed that they are expected to share in the reduction of income that their non-panel colleagues and practically all other sections of the community have experienced already. Therefore it is interesting to estimate exactly what that reduction will be. Three examples will suffice:—

1. The doctor with 3000 panel patients accepting the reduction of 1*s.* 6*d.* per capita will lose £225 of the £1650 per annum he receives now. The B.M.A. attempts to save him £75 of this sum. 2. Recently a practice of £2400 including a panel of 1300 was advertised. Under the proposed reduction the value of this practice is reduced by £97 10*s.* The B.M.A. attempts to save the vendor £32 10*s.* of this. 3. The practitioner with a panel of 500 stands to lose £38 10*s.*, of which sum the B.M.A. proposal would save him £12 10*s.*

All will sympathise with the men, and many there be, who have given of their best to the service regardless of remuneration and are likely to continued so to do. Others will find consolation in the fact that the present reduction is equivalent to less than half the increase awarded in March, 1920. But we believe that a majority in the profession are too proud of their calling and too jealous in their service to the community to condescend to "haggle over sixpence," and we believe these will agree that the only proper and dignified course to take lies in acceptance of the Minister's proposal as part of a necessary national economy shared by all.

At the same time it appears necessary to press for an early and independent inquiry into the working of the Acts to ascertain *not* what the profession is willing to give the people for 9*s.* 6*d.*, but how far the system has tended to improve the nation's health and how a more fully efficient service can be provided, linked up with general practice and with specialised branches. No fee that the people of this country can afford would be too high for such a service and certainly they would not begrudge it.

We are, Sir, yours faithfully,

MALCOLM MORRIS, Vice-President.
CHAS. BUTTAR, Hon. Secretary.
N. HOWARD MUMMERY, General Secretary.

Federation of Medical and Allied Societies, 12, Stratford-place, W. 1, Oct. 17th, 1921.

ANKLE-JOINT FRACTURES.

To the Editor of THE LANCET.

SIR,—Sir W. Arbuthnot Lane, in his instructive paper on Abduction Fractures of the Ankle-Joint in THE LANCET of Oct. 1st, has done well to draw the attention of surgeons both to the mechanics of the injury, as well as to the permanent lameness which only too frequently is left behind. These unfortunate results are, in his opinion, largely due to the tendency of lumping together under the generic name of "Pott's" all fractures round the ankle-joint, without sufficient consideration of the lines of force which caused them. Cases of lameness and disability caused by these fractures come frequently to my notice, and I have been struck by the apparent difficulty surgeons have in obtaining perfect soundness.

Take, for instance, the first degree of this condition: many a time does it come under observation as being a sprained ankle which is proving slow in recovery. This diagnosis is often due to the presence of adhesions, more likely to occur when there has been a fracture than when a simple sprain has been sustained. In dealing with cases of sprained ankle where no obvious bone lesion is present, the question as to whether the ankle turned outwards or inwards at the time of accident is of importance, since the first degree of fracture only occurs where there has been an abduction of the foot. A radiograph is advisable, more as a guide to prognosis than diagnosis, since treatment where displacement is negligible is practically the same as in a sprain, but the period of disability is prolonged.

In the second degree of fracture, though accurate splinting can bring about good results, yet it must be acknowledged that permanent lameness is far from uncommon; so much so that at one time in our police force the fact that a man had sustained a "Pott's" fracture was considered a bar to his further employment.

The third degree of this fracture would appear to offer enormous difficulty to a satisfactory result under manipulation, and quite recently, I have seen a case of this kind, where the resultant distortion and lameness was pitiable. The accident occurred early in February of this year, whilst the patient—a man of about 40—was walking through a Borneo jungle. The medical man tried to get reduction under anæsthesia, eventually putting the limb up in plaster-of-Paris. Three weeks later the patient was able to be removed to Jesselton, where a radiograph showed the position of the bones to be precisely as in Fig. 3 of Sir Arbuthnot Lane's paper. Another attempt was made at reduction without result. The patient became dangerously ill from shock, and after some weeks was sent to England with a note stating that he had sustained a fracture-dislocation of the right ankle. On examination the leg was found to be thin and emaciated, with limited flexion of the foot, intense muscular wastage of the thigh with contraction of the knee; the upper end of the tibia formed a projection over the instep, whilst the os calcis formed a corresponding curve behind. A further radiograph showed the position of the bones as before, but the formation of callus and the general condition of the joint made operative interference inadvisable. Treatment by massage and graduated exercises is now making the best of a bad job. The patient was inclined to find fault with the attention he had received in Borneo, but the result, although undoubtedly disastrous, was no worse than is seen in cases where greater facilities for treatment have been available.

Considering the doubtful results so often obtained by the present method of setting and splinting these ankle-joint fractures, I am convinced that reduction by the operation procedure described by Sir Arbuthnot Lane holds out an almost certain prospect of soundness, since an almost perfect apposition can be obtained by a knowledge of the mechanics involved in the causation of the fracture.

I am, Sir, yours faithfully,

Seymour-street, W., Oct. 15th, 1921. FRANK ROMER.

TEACHING "DEAF-MUTES" TO HEAR.

To the Editor of THE LANCET.

SIR,—In the annotation in your issue of Oct. 8th on the late Prof. Urbantschitsch's paper on the use of acoustic exercises in the education of deaf-mutes, you do not refer to the work on similar lines which has been independently carried out in England, and to which reference was made in my Croonian Lectures published in your columns about a year ago. At the Birmingham meeting of the Association of British Physicians in April of this year I showed seven "deaf-mutes," ranging in age from 5 to 32, who were being taught to hear. All of them had been regarded as absolutely deaf both by their parents and by well-known aural surgeons who had seen them with me, but as they all showed normal vestibular reactions, I thought their deafness was probably functional. After periods varying from a year and a half in one case to between two and six months in most of the others considerable improvement had occurred. Each of the patients was now able to hear a large variety of sounds; one of them could hear the clicking of coins at a distance of 30 feet. Each could recognise and understand a considerable number of words, and four of them were able to carry on a conversation, when sentences were spoken slowly and in a loud voice close to their ears. Two of the children are having all their ordinary lessons by ear instead of by lip-reading.

Improvement has so far been continuous, though slow, and I think that there is a good prospect that the more intelligent among them will eventually learn to hear sufficiently well to enable them to carry on ordinary conversations.

I am, Sir, yours faithfully,

ARTHUR F. HURST.

New Lodge Clinic, Windsor Forest, Oct. 11th, 1921.

OCCUPATIONAL THERAPY IN HEART DISEASE.

To the Editor of THE LANCET.

SIR,—When a diagnosis of heart disease has been made in a child the questions arise of the scope and direction of the child's education, and of the extent to which games may safely be indulged in. For the adult with permanent cardiac disability advice is needed with regard to suitable occupation; the value to the individual of every year of even a restricted working capacity is apparent, not only in the light of the achievements of the phthisical Keats and R. L. Stevenson, the blind Milton and the epileptic Napoleon, but also with regard to recent post-war experience of occupational therapy, which enables blind and otherwise crippled men to find a place in industry, and thereby enjoy a measure of contentment. That a great deal can be done in this direction is shown in a recent contribution to the *Modern Hospital*, January, 1921, by Dr. F. L. Brush, medical director of the Burke Foundation, White Plains, N.Y., in a paper mainly based upon experience of over 2500 cases of heart disease, of which more than 2000 had valvular deficiencies.

The plan followed by Dr. Brush may be briefly outlined. The first thing is to undo the effect of wrong advice "of physicians, relatives, employers, teachers," replacing "don'ts and can'ts by do's and can's." The patient recovering from acute disablement is given light hand-work in bed or chair and exercised up to fitness for transfer to a convalescent home, where he goes through four to nine weeks of gymnastic exercises, increasingly active physical play and grade walking, diversional occupation, and short hours of actual work about the institution, often on a handicapped wage. Gradual advance to full-time employment in the institution with medical oversight leads later on to the former job or to another expertly chosen by the "follow-up" agency. The author indicates the various occupations for which his patients have become fitted, such as gardening and carpentry for men and needlework for women. Dr. Brush advises the continuance

of school work for children. The present writer has always advocated the minimum of interference with the education of the child with cardiac disability[1]; in the recently published Encyclopædia of Education he has also indicated the rôles of education and games[2]; every effort should be made to keep the child from dwelling on his physical condition; such expressions as "weak heart," "heart disease," &c., should be avoided in his presence.

In the course of an extensive experience with heart cases in hospital and private practice the writer, in common with other physicians, has been able sufficiently to improve the condition of patients to allow them to return to their former employment; treatment and rest have not only restored a more normal function, but have also built up a certain amount of cardiac reserve. With the majority of these patients, however, this cardiac reserve is sooner or later exhausted, and the patient returns to hospital in a more advanced stage of disease. This sequence of events is repeated until the end is reached; it is in these cases that occupational therapy might at least have postponed the catastrophe. Temperament and adaptability must be made important factors in the selection of appropriate work. Two cases recently under the writer's care may be given in illustration.

A schoolboy, aged 15 years, was first seen in 1915 on his approaching entry into a public school. The question was the extent to which he should be allowed to play games. The boy was in good health, but examination revealed mitral stenosis; directions were sent to the house master, and the school doctor observed the effects of the games prescribed. Later I had a satisfactory report from school and parents. Four years later, without reference to my opinion, the lad was articled to a firm of engineers. All went on well until he passed into "the shops"; after a while he had sudden severe cardiac pain followed by a fainting attack, which was the occasion for a further consultation. On examination the presystolic murmur was well in evidence, the cardiac dullness was markedly extended to the right, and the apex beat outside the nipple line; there was also epigastric pulsation. A period of complete rest followed by graduated exercises restored the heart to a fairly normal state. It was decided he should have a lighter job, and he obtained a post in which clerical work was associated with engineering experience. The result has so far been satisfactory.

A man, 56 years of age, had symptoms of angina pectoris. The history showed that as a boy his health was not good; as his intelligence was not of a high order his parents had failed to educate him. He had a marked talent for music, but this had not been cultivated.

With Dr. Brush's record of success in heart cases by means of occupational therapy before us, alongside our own experience in cases lacking that valuable adjunct to treatment, one cannot but hope that once the need for an institution such as the Burke Foundation is made known means will be provided for its establishment in this country.

I am, Sir, yours faithfully,

CHARLES W. CHAPMAN.

Harley-street, W., Oct. 14th, 1921.

DIAGNOSIS AND TREATMENT OF DIPHTHERIA.

To the Editor of THE LANCET.

SIR,—Some years ago I pointed out in your columns that cases of scarlet fever recovered more slowly and less perfectly in the fever hospitals of London than similar cases treated at home. I could only ascribe this difference to the aggregation of cases in the hospitals, with consequent abundance or concentration of the poison. Probably the same is applicable to diphtheria even in a greater degree; this, being a zymotic disease with serious implication of the throat and air passages, requires dispersion of cases and abundance of fresh air and sunlight. I do not, however, think that any hospital conditions justify what seem to me the erroneous views of and dangerous advice given by Dr. F. H. Thomson in his article on this subject published in your issue of July 9th, p. 68. With his strong approval of antitoxin I am in accord, though I am inclined to think that many medical men find somewhat smaller doses, provided these are given early, to be sufficient. I am not aware, though, that larger doses are harmful. The fault that I find with Dr. Thomson is his advocacy of complete and prolonged recumbency in all cases—even if only mild or moderate in degree—as most of them are. In mild cases without much pyrexia, I do not see that absolute recumbency is necessary; and when pyrexia has subsided, it is not merely unnecessary but prejudicial. There seems to be prevalent an idea of "heart weakness," which in ordinary mild cases (and the exceptions I believe to be very few) I look on as purely imaginary. The special focus of trouble in all, and especially the laryngeal and tracheotomised cases, is the lungs, which are more or less filled with noxious mucus and secretions inhaled from the throat, and are apt to become collapsed and even pneumonic. This is the chief cause of remaining debility, including any disturbance of the heart. The lungs naturally get poisoned by the inspired air passing through the foul throat. The main object of treatment in hastening convalescence is to promote active respiration and get the lungs expanded in the purest air that can be got. This cannot be effected while the patient is lying passively in bed in a sick room; suitable activity—as much as can be borne—is required. I do not deny that there may be cases where the heart is peculiarly attacked, but these are very unusual and I have no experience of them. Those cases which are complicated by affection of the vagus nerve, when a serious condition sets in almost suddenly with vomiting and great and progressive slowing of the pulse, are, I believe, always fatal, whatever treatment is employed. I think that since the introduction of antitoxin they have become much less common. I do not remember having seen one since.

I will not prolong this letter by discussing the advisability of local treatment. The various methods are set out in the text-books, with various opinions as to their merits or the reverse. For my own part I am at one with Dr. Thomson in disapproving of all strong and irritating applications, whether used as "antiseptics" or not, though I think that it is always beneficial to keep the throat as clean and sweet as possible by the use of permanganate solution, as gargle or swab, which is quite harmless and painless.

I am, Sir, yours faithfully,

F. LUCAS BENHAM, M.D., M.R.C.P.

Exeter, South Australia, Sept. 3rd, 1921.

POLYPOID DECIDUAL ENDOMETRITIS.

To the Editor of THE LANCET.

SIR,—In your otherwise excellent report of the paper read before the Section of Obstetrics of the Royal Society of Medicine on the above subject, there is one obvious error, which, however, I point out to correct. The report says that the disease "might extend down to the external os." It should, of course, be *internal* os.

The only point that needs correction in the necessarily condensed summary of the discussion, is that I am credited with the statement that "I could not say what proportion of septic cases were due to polypoid decidual endometritis." I do not remember that this specific question was asked, but I do say that probably 50 per cent. of all septic cases will be found to be due to this condition, especially if the microscope be more generally employed in midwifery work.

Permit me to add that in some cases of polypoid decidual endometritis death is known to have occurred on the tenth day following delivery, so that the postponement of any operative measures till after that date cannot be recommended.

I am, Sir, yours faithfully,

FRANK A. NYULASY, M.D., B.S.

New Metropole Hotel, Northumberland-avenue, Oct. 17th, 1921.

[1] Heart Disease in Childhood and Youth. Medical Publishing Company. 1900.

[2] "Heart Strain in Children from the School Clinic and Educational Point of View," an article in the Encyclopædia of Education. Sir Isaac Pitman and Co. 1920.

SULFARSENOL IN THE TREATMENT OF CONGENITAL SYPHILIS.

To the Editor of THE LANCET.

SIR,—With reference to your annotation in THE LANCET of Oct. 8th on our short paper on Sulfarsenol in the Treatment of Congenital Syphilis, the object of this paper was to compare the result of intramuscular injection of sulfarsenol with the intravenous injection of some of the older remedies. We stated in our paper that the clinical manifestations quickly disappear under treatment with sulfarsenol. The Wassermann reaction was used as the gauge of the efficacy of treatment rather than the disappearance of clinical manifestations, because it is considered by most authorities to be a very much more sensitive test. Indeed, clinical manifestations frequently clear up after a short course of mercury, but who would claim to have eradicated the disease by such treatment?

The results obtained at the Royal Hospital for Sick Children, Glasgow, with ante-natal treatment are not in accord with those referred to by Mr. McDonagh—we have not, however, been able to find any definite figures published by him. Of 15 mothers treated in this hospital, all the offspring born subsequent to treatment gave a negative Wassermann reaction with one exception, which gave, at the age of 7 years, a weakly positive reaction. Neither this case nor any of the others have as yet shown any clinical signs of syphilis. Six families have been followed for seven years and, with the exception noted, have all given a negative Wassermann reaction, and none of them show clinical manifestations.

Lastly, the results of our treatment of children under 1 year of age shows a marked declension from those obtained by intravenous treatment and the failure in these cases cannot be explained by a hypothesis based on Mr. McDonagh's findings. Why, therefore, should such an explanation be applied to our cases over 1 year of age?

We are, Sir, yours faithfully,
E. CRAWFORD.
GEOFFREY B. FLEMING.

Royal Hospital for Sick Children, Yorkhill, Glasgow, Oct. 12th, 1921.

REACTIONS AFTER SALVARSAN.

To the Editor of THE LANCET.

SIR,—In an article in the *Arch. Int. Med.* on 9000 cases of syphilis treated at the Johns Hopkins Hospital, Baltimore, Dr. T. E. Moore and Dr. A. Keidel give some particulars of skin reactions following the treatment by salvarsan.[1] I imagine the case I report here is probably unique.

Mr. O. B. S., aged 22, came to me on June 28th, 1921, with a quite typical hard chancre. I gave him a series of injections of N.A.B., dose 0·75, and on Sept. 29th I administered his ninth injection. He was taking hyd. c. cret., gr. 2, three times daily without intermission for the whole time. On the morning of Oct. 7th he came in to see me with an erythematous rash all over him, including his face, wrists, and hands; it was accompanied by intense itching. I diagnosed urticaria and ordered him sodium salicylate, sodium bicarb., and ammonium carbonate. The same afternoon I had an appointment to give him his tenth injection of N.A.B. At 5 P.M., when I saw him again, he had not taken any of my mixture. In five minutes from the moment of the injection he remarked that the itching was less and on examination the "wheals" of the urticaria were noticeably less. In 15 minutes my patient said there was no itching, and on further inspection only pale pink patches remained in the place of the raised areas. Dr. Moore and Dr. Keidel speak of urticaria as a possible result of salvarsan injections. Here is a case of "nettle-rash" being dispersed by the same agent. I was unable to discover any cause for the skin condition.

I am, Sir, yours faithfully,
LEONARD MYER, F.R.C.S.E.,
Hon. Surgeon to Out-patients, St. Paul's Hospital for Skin and Genito-Urinary Diseases.

Oct. 17th, 1921.

[1] Brit. Med. Jour., Oct. 15th, p. 606.

PRESENTATION TO SIR J. HALLIDAY CROOM.

To the Editor of THE LANCET.

SIR,—May I, through the medium of THE LANCET, bring to the notice of Sir Halliday Croom's old residents and clinical assistants that it has been decided, through a presentation, to show our gratitude to him. Unfortunately the earlier records are incomplete, and as secretary of the committee which has been appointed, I should be glad if those who were with him prior to 1890 and are willing to contribute would kindly send their names and addresses to me.

I am, Sir, yours faithfully,
DOUGLAS MILLER.

50, Northumberland-street, Edinburgh, Oct. 17th, 1921.

Obituary.

GEORGE WILSON, M.D., C.M., LL.D. EDIN., M.A. ABERD., D.P.H. CAMB.

ON Sept. 11th, at his home in Colwyn Bay, the death occurred of Dr. George Wilson, who was a pioneer in the teaching of hygiene. The Public Health Act of 1872 raised much discussion on sanitary questions throughout the country, and the publication in 1873 of Dr. Wilson's "Handbook of Hygiene" received an immediate and cordial welcome. This was practically the first text-book on hygiene available for medical students and was, moreover, for many years the standard manual for candidates for the D.P.H. In the eighth edition, however, issued in 1898, Dr. Wilson introduced his somewhat heterodox views on bacteriology and the causation of disease, when the book lost much value as a text-book and no further editions were called for. Dr. Wilson had become a Master of Arts at Aberdeen in 1860 and proceeded for his medical education to Edinburgh, where he graduated M.B., C.M. in 1863, M.D. in 1872. He received the honorary degree of LL.D. of Edinburgh in 1894 and was a Fellow of the Royal Society of Edinburgh. He took the D.P.H. at Cambridge in 1891. When surgeon to the convict prison at Portsmouth in the early seventies Dr. Wilson made observations on the criminals under his charge and formed the conclusion "that four-fifths are directly or indirectly the victims of intemperance." His comment on the scale of diet then given for full labour in prisons was that the prisoners lost weight on it to an extent of about 13 lb. in two months and had to be continuously transferred to lighter work and retransferred if a complete breakdown was to be avoided.

Dr. Wilson was medical officer of health for the Mid-Warwickshire Combined District for over 30 years, retiring in 1909. In 1906 he was appointed a Member of the Royal Commission on Vivisection. He was proud of this distinction and gave much time and labour to the work of the Commission. He appended to the Final Report issued in 1912 a lengthy Reservation Memorandum, but he signed the main report and declined to be regarded as a representative of the anti-vivisectionists. After his retirement Dr. Wilson travelled abroad for some years and then settled in Colwyn Bay. The eye troubles, caused by cataract, from which he suffered in his later years were only partially relieved by operation and his vision remained dim.

Dr. Wilson married twice but had no children. To his widow we offer sincere sympathy in her great loss.

THE LATE DR. WILLIAM EDWARD DIXON.—Dr. W. E. Dixon, who died at his residence "Kirkee," West Worthing, on Oct. 10th at the age of 75, received his medical education at the Middlesex Hospital, where he afterwards became house surgeon and resident obstetrical assistant. He qualified M.R.C.S. Eng., L.S.A., L.R.C.P. Edin., and L.M., in 1878, and held the post of clinical assistant at the Royal London Ophthalmic Hospital, becoming F.R.C.S. in 1881.

THE King and Queen have sent a present of fruit to the Chelsea Hospital for Women.

Medical News.

UNIVERSITY OF CAMBRIDGE.—At the Second Examination for Medical and Surgical Degrees held recently the following candidates were successful:—

Part II., Pharmacology and General Pathology.—F. N. Adams, C. Adamson, G. L. Alexander, R. D. Alexander, H. S. Allen, W. B. Arnold, H. F. Brewer, G. C. W. Brown, N. F. C. Burgess, B. H. Burns, J. T. Burrell, G. A. H. Buttle, R. T. Chadwick, H. D. Chalke, P. F. Chandler, B. H. Cole, H. V. Coverdale, D. Cuffey, W. I. Daggett, C. H. C. Dalton, W. Daniel, J. H. T. Davies, P. O. Davies, F. M. Deighton, G. W. S. de Jersey, W. F. Eberlie, A. B. Eddowes, A. Elliot-Smith, J. B. Ellison, R. B. Fawkes, C. W. S. Fernando, K. Fletcher-Barrett, J. H. Francis, J. H. Gaddum, J. A. Galletly, W. H. Gervis, N. T. Glynn, T. S. Goodwin, H. W. Gordon, F. E. Graham-Bonnalie, J. Gray, O. Gray, S. J. P. Gray, F. N. Green, H. L. H. H. Green, J. V. Griffiths, C. J. P. Grosvenor, C. C. Halliwell, A. C. Hampson, H. E. Harris, P. M. D'A. Hart, B. D. Hendy, R. A. Hickling, C. H. Hilliard, E. G. Holmes, J. Holmes, W. S. Hunt, W. E. Hunter, J. P. W. Jamie, J. W. W. Jepps, F. H. King, M. C. H. Kingdon, R. L. Lancaster, A. L. Lankester, F. W. Law, G. A. Q. Lennane, S. Levy-Simpson, W. A. Lister, R. J. Lythgoe, A. F. McGlashan, W. W. McLean, D. P. Marks, L. P. Marshall, G. A. Metcalfe, H. D. N. Miller, K. F. T. Mills, E. F. Molony, W. B. R. Monteith, A. C. Mowle, E. B. Murrell, J. Ness-Walker, T. M. Preece, L. W. Proger, R. J. V. Pulvertaft, W. Richards, J. A. W. Roberton, R. E. Robinson, R. A. M. Scott, J. W. Shackle, C. J. L. Sharp, F. A. H. Simmonds, A. J. Smyth, J. H. Smyth, H. L. Sparrow, J. D. M. Stewart, G. B. Tait, J. H. G. Thompson, K. H. Uttley, F. C. O. Valentine, W. J. Walters, Y.-S. Wan, E. R. Weaver-Adams, V. B. Wigglesworth, C. E. Woodrow, and H. Yates.

UNIVERSITY OF ST. ANDREWS.—At the Third M.B., Ch.B. degree examination held recently the following passed in Pathology: Thomas Christie, Lewis Farrell, Lutfur Rehman Khan, Ena McAlistair Liddell, John Russell Murray, Noel Nelson, John Petrie, James Alexander Robb, and Donald Bruce Smith.

ST. GEORGE'S HOSPITAL MEDICAL SCHOOL (UNIVERSITY OF LONDON).—The following Entrance Scholarships and Exhibitions have been awarded:—

90 guinea scholarship: G. K. Thornton, Corpus Christi College, Cambridge; £70 scholarship: R. W. Smith, Downing College, Cambridge.

Exhibitions of the value of 40 guineas each: E. F. Johnson, King's College, London; A. J. Smyth, Emmanuel College, Cambridge; and H. R. Mathews, Corpus Christi College, Cambridge.

ST. THOMAS'S HOSPITAL MEDICAL SCHOOL.—The following entrance scholarships have been awarded for the sessions 1921–22:—

Entrance Scholarship in Arts, £25: R. A. Hill, Merchant Taylors' School.

Entrance Scholarship in Natural Science, £150: J. M. Ashton, Intermediate School, Towyn and St. Thomas's.

Entrance University Scholarship, £100: divided between R. J. V. Pulvertaft, Trinity College, Cambridge, and C. A. Lupton, Trinity College, Cambridge, equal.

NATIONAL BABY WEEK COUNCIL.—The annual general meeting of the Council will be held on Oct. 25th, in Armitage Hall, 224, Great Portland-street, W. (by permission of the National Institute for the Blind), at 3 P.M., under the presidency of Viscount Astor, chairman of the Council. The principal speaker will be Dr. W. Allen Daley, M.O.H. for Blackburn, whose subject will be the Economic Value of Maternity and Child Welfare Work. The address will be followed by a discussion. Tickets for the meeting may be obtained from the Secretary to the Council, at 5, Tavistock-square, London, W.C. 1.

ROYAL COLLEGE OF SURGEONS OF ENGLAND.—A quarterly Council meeting was held on Oct. 13th, with Sir Anthony Bowlby in the chair.—The secretary reported the death of Mr. John Ward Cousins, past member of the Council, and deep regret and sincere sympathy with his widow and family was expressed by the Council.—It was announced that an agreement had been reached between the Council and the Secretary to the War Office with reference to the care of the Army Medical War Collection of Pathological Specimens by the College.—Mr. F. F. Burghard submitted a draft copy of the annual report of the Council which will be presented to the Fellows and Members at the annual meeting on Nov. 17th next. The report was approved and adopted.—A report was read from the committee of management recommending the recognition of the High School for Girls, Wimbledon, for instruction in chemistry, physics, and biology, and reporting that Sir William Hale-White and Mr. W. F. Haslam retire by rotation from the committee.—Mr. W. G. Spencer was elected a member of the committee of management.—The President reported that the portrait of the late Mr. Hugh Owen Thomas, of Liverpool, presented by Sir Robert Jones, had been received and had been hung in the inner entrance hall. The thanks of the Council were given to Sir Robert Jones for his gift.—A letter was read from the College of Preceptors stating that they are endeavouring to arrange for the formation of a joint committee representing the medical and teaching professions to inquire into the present practices in the physical training of girls and their effects, and asking the College to appoint two representatives to serve on the proposed committee. The Council nominated Sir Charles Ryall and Mr. W. G. Spencer to represent them on this committee.

Museum Demonstrations.—The following demonstrations of specimens in the Museum will be given in the Theatre of the College in Lincoln's Inn Fields during October and November at 5 P.M. The demonstrations are open to advanced students and medical practitioners. On Monday, Oct. 24th, Prof. S. G. Shattock will demonstrate on Papilloma and Adenoma, on Oct. 31st on Degenerations and Necrosis, and on Nov. 7th on Cysts. On Friday, Oct. 28th, Sir Arthur Keith will give a demonstration on Effects following Disordered Action of Thyroid, illustrated by lantern slides. On Nov. 4th he will show specimens and slides illustrating various kinds of disordered growth at the epiphyseal line, and on Nov. 11th he will demonstrate on recently added specimens of clinical and anatomical interest.

CHELSEA CLINICAL SOCIETY: ANNUAL DINNER.—This dinner will be held on Tuesday, Oct. 25th at the Café Royal, Regent-street, London, W., at 7.30 o'clock.

OLD STUDENTS' DINNERS.—*St. George's Hospital.*—The opening of the winter session at St. George's Hospital Medical School did not include the customary introductory address. More than 80 past and present pupils of the school were present at the annual dinner at the Imperial Restaurant, Regent-street, on Oct. 1st, under the chairmanship of Dr. H. A. Des Vœux. The Chairman, in proposing the toast of the evening, "The Corner," recalled his own experiences as a student some 40 years ago and contrasted the position of the school at that time with that of to-day. He made a sympathetic allusion to the death of Mr. Warrington Haward. This speech was responded to by Mr. E. B. Turner on behalf of the past students, who recalled the wonderful athletic prowess of the school in his day and urged St. George's to get back to this ideal as quickly as possible. The Dean spoke on behalf of the present students and intimated in his remarks that the entry this year was the best that has occurred for some years. Dr. T. Vincent Dickinson gave the health of the chairman and spoke of his great services to the community in his professional and public capacities as chairman of the Coal Smoke Abatement Society and as organiser of measures for the relief of our Belgian professional confrères and their dependents during the great war. This was received with muscial honours, and Dr. Des Vœux replied. Finally, Sir George Turner gave the health of the dinner secretaries, Mr. Claude Frankau and Dr. J. A. Torrens.

University College Hospital Medical School.—The annual dinner of past and present students was held at Oddenino's Imperial Restaurant on Oct. 6th. The chair was taken by Dr. Henry D. Waugh, and over a hundred old students attended. The toast of "The Hospital and Medical School" was proposed by the chairman and was responded to by the Dean, Dr. G. F. Blacker. A pleasant musical programme was supplied by Drs. Poynton, Leslie Williams, Somervell, and Claremont, and the evening concluded with the toast of "The Chairman," proposed by Sir Rickman Godlee.

Westminster Hospital.—The annual dinner of past and present students was held at the Grand Central Hotel on Oct. 7th, Sir Charles Ryall, presiding. The attendance numbered 101, including seven ladies. Sir Charles Ryall proposed the toast of "The Hospital and Medical School," to which Dr. A. S. Woodwark, the Dean, replied, pointing out the successful development of the medical school on its return to pre-war conditions, the present number of students being the largest for the past 15 years. Mr. Arthur Evans proposed "The Past and Present Students," to which Surgeon Rear-Admiral W. E. Axford, Lieut.-Colonel A. de C. Scanlan, and Dr. Walter Barron replied, the latter expressing his pleasure as a general practitioner that the hospital was to remain in its present situation. Mr. Souttar also spoke on behalf of the present students and referred to the exceptional teaching facilities provided. Mr. Rock Carling proposed "The Visitors," for whom Sir Murdoch Macdonald, and Dr. Edwin Smith responded. Mr. W. G. Spencer proposed "The Chairman," who, in his reply, read out some of the testimonials he had received as a student, including those of Dr. F. de Havilland Hall, consulting physician to the hospital, and Mr. Spencer, both happily present on this occasion.

GROUPE INTER-UNIVERSITAIRE FRANCO-BRITANNIQUE.—A dinner in honour of Mr. Raymond Poincaré, past President of the French Republic and former Rector of the University of Glasgow, will be held on Nov. 1st, at 7.15 P.M., at the Connaught Rooms, Great Queen-street, Kingsway, W.C. Applications for tickets, £1 5s. per head, should be made immediately to the Joint Hon. Secretaries, at 51, Anson-road, London, N.W. 2.

MIDLAND TUBERCULOSIS MEETING.—The first general meeting of the Midland Tuberculosis Sub-Group of the Society of Medical Officers of Health will be held at the Anti-Tuberculosis Centre, 44a, Broad-street, Birmingham, to-day, Oct. 22nd, at 3 P.M. It is hoped that all members of the Society of Medical Officers of Health actively engaged in connexion with tuberculosis work will attend this meeting. The business to be transacted includes the confirmation of the proposed rules, and the election of officers and committee for the ensuing year.

EASTBOURNE EAR, NOSE, AND THROAT HOSPITAL. The annual meeting was held on Oct. 7th. The existing premises were opened on March 2nd last, and in-patients were first received on April 6th. Up till July 31st—the end of the hospital year—the in-patients numbered 55. The out-patients for the full 12 months numbered 2415. The financial statement showed that the hospital was in a better position than last year by £700. The first year's working of the institution as a fully equipped hospital shows that the step taken by the governors was a wise one.

TUBERCULOSIS IN GLOUCESTERSHIRE.—At the weekly luncheon of the Gloucester Rotary Club held on Sept. 30th, Dr. Arnott Dickson, county and city tuberculosis medical officer, gave an account of the campaign of public health authorities against tuberculosis, in the course of which he said that although the mortality from that cause was diminishing, there was still some justification for John Bunyan's description of consumption as "Captain of the Men of Death." Eighty per cent. of children were infected at the age of 14, and it was of extreme importance to ensure that the immunity which the child struggled to acquire should be strengthened into a bulwark for the rest of life. It was unfortunate that the Tuberculosis Order of 1912–13, suspended on the outbreak of war, had not been revived, and that the distribution of milk from cows with advanced tuberculous disease was still permitted. The question of housing, again, was of the very greatest importance; a large number of families simply did not get a chance of living healthy lives. While the outlook in tuberculosis work was encouraging, there was in the present state of knowledge no justification for expecting any immediate or sensational defeat of a disease which was almost an inherent defect of civilisation.

ROYAL VICTORIA HOSPITAL, BELFAST: OPENING OF THE SESSION.—The present session was opened on Oct. 13th, when Colonel A. B. Mitchell occupied the chair and the opening address was delivered by Dr. H. L. McKisack. After welcoming the students and alluding to the changes in the staff during the past year, the speaker referred to the retirement of the late superintendent, Colonel A. Deane, and spoke appreciatively of his long services to the hospital. He extended a cordial welcome to his successor, Colonel J. V. Forrest, C.B., C.M.G. He referred to the foundation of the new dental department in the hospital, and alluded to the grave results which were now known to accrue from oral sepsis. A knowledge of dentistry was important not only for practising dentists, but also for the general practitioner. He wished to emphasise the fact that clinical instruction is the heart and kernel of the Ars Medica, while welcoming all the recent developments of laboratory methods. It was a liberal education in itself, developing the powers of observation and induction, and cultivating the judgment. The student must first study the normal individual and the condition of the healthy organs. Next he must learn the main facts of disease from his teachers and his text-books, and thirdly, he must exercise his own powers of observation and inquiry. He urged the importance of students becoming residents in hospital, and being in constant contact with the phenomena of disease. The student should acquire the habit of tabulating his own experience, and correlating it with the information afforded by his teachers. Experience to be of permanent value must be organised and sifted, otherwise it was a case of heaping ignorance upon ignorance. The student must cultivate the spirit of curiosity and inquiry and never hesitate to ply his teachers with questions. The young must carry forward the torch of research and education, and cherish the hope that they may be privileged to add something to the weapons for the endless war to be waged against disease. A vote of thanks to the speaker was passed on the motion of the chairman.

DR. LLOYD ROBERTS'S ART BEQUEST TO MANCHESTER.—The bequest of paintings, mezzotints, drawings, glass, china, and silverware of the late Dr. Lloyd Roberts has been formally handed over to the Manchester Corporation. The collection, which occupies four rooms in the Art Gallery, is of great value and distinction, and was opened to the public on Oct. 12th.

TREATMENT OF EARLY TUBERCULOSIS IN BRISTOL.—On Oct. 5th Sir William Treloar formally opened the Frenchay Park estate, purchased by the Bristol city council to provide for the open-air treatment of early tuberculous children. The buildings already standing will, it is hoped, provide accommodation for as many as 35 children, and will be used until it has been found possible to build wards to take 100 beds. In the meantime Bristol is still without suitable premises for the treatment of "surgical" tuberculosis, and has to be content with sending a few patients to Alton.

ST. THOMAS'S HOSPITAL MEDICAL AND PHYSICAL SOCIETY.—Meetings of this society are held in the Club Reading Room at 8.30 P.M., under the presidency of Mr. J. E. Adams. The programme for the session is as follows. On Oct. 27th Dr. R. C. Jewesbury will speak on Child Welfare. On Nov. 10th a clinical and pathological evening will be held, and on Nov. 24th a mock trial on "A Case of Malpraxis." On Dec. 8th a clinical and pathological joint meeting will be held jointly with Guy's Hospital Physical Society at St. Thomas's Hospital. On Jan. 12th a discussion, "That Agitation is Essential to Progress," will take place, and on Jan. 26th a clinical and pathological joint meeting with Guy's Hospital Physical Society will be held at Guy's Hospital. On Feb. 9th Dr. Charles Singer will lecture on Medicine among the Ancient Greeks. Feb. 23rd and March 23rd will be devoted to clinical and pathological evenings, and on March 9th Sir A. Conan Doyle will address the society on Science and Psychology.

LEEDS AND WEST RIDING MEDICO-CHIRURGICAL SOCIETY.—The first meeting of the session was held at the Leeds General Infirmary on Oct. 14th, when Sir Berkeley Moynihan, the new President, occupied the chair. There was a very large attendance of members. Amongst a number of interesting cases and specimens on view Mr. Carlton Oldfield showed a specimen of ovarian gestation. At the conclusion of the discussion on cases, the President delivered an opening address on Medicine in Art. A large number of lantern slides, illustrating the portrayal of diseases and deformities in the works of the great masters, were shown by the speaker, who gave a most lurid and eloquent exposition of his subject. The address was listened to by an interested and enthusiastic audience.

CLINICAL SOCIETY OF MANCHESTER.—The Committee of the Clinical Society of Manchester have determined to devote the future meetings of the society to the demonstration and discussion of the latest methods of scientific investigation and their practical bearing on clinical medicine; this new departure is the result of a feeling that the usefulness and scope of a society hitherto devoted to discussion of unusual and difficult cases has been diminished by the post-graduate courses, &c., now held in several Manchester hospitals. The proposed syllabus for the coming session is as follows: (1) Physiology (November)—respiratory problems more especially associated with the composition and chemistry of alveolar air; (2) Pathology (January)—the Wassermann reaction and other blood tests; (3) Physiology (March)—special meeting at which an eminent physiologist will be invited to read a paper on the bearings of modern physiology on clinical medicine; (4) Pharmacology (May)—the digitalis group; (5) Anatomy (July)—nerve injuries.

ALVARENGA PRIZE.—The College of Physicians of Philadelphia announces that the next award of the Alvarenga prize (value about $300) will be made on July 14th, 1922, provided that an essay deemed by the committee of award to be worthy of the prize shall have been offered. Essays may be upon any subject in medicine, but must not have been previously published. MSS. must be typewritten, and if written in a language other than English should be accompanied by an English translation; they must be received by the Secretary of the College on or before May 1st, 1922. Each essay must be sent without signature, but plainly marked with a motto, and accompanied by a sealed envelope having on its outside the motto of the paper and within the name and address of the author. It is a condition of competition that the successful essay or a copy of it shall remain in possession of the College; other essays will be returned upon application within three months after the award. The Alvarenga prize for 1921 has been awarded to Dr. John W. Churchman, N.Y. City, for his essay entitled Selective Bacteriostasis of Gentian Violet.

Dr. William F. R. Burgess, O.B.E., has been elected Master of the Society of Apothecaries.

PHARMACEUTICAL SOCIETY OF IRELAND.—At the annual election of officers held on Oct. 11th a medical man, Mr. Alfred Barnes, L.A.H., of Dublin, was chosen as the new President.

LITERARY INTELLIGENCE.—The Dictionary of Practical Medicine, edited by Sir Malcolm Morris, Prof. Frederick Langmead, and Dr. Gordon Holmes, is announced for publication on Oct. 27th by Messrs. Cassell and Co.

MANCHESTER CATHEDRAL: ANNUAL MEDICAL SERVICE.—At the annual service for the medical and nursing professions, held at Manchester Cathedral on Sunday last, there was a large attendance of doctors and nurses. The Archbishop of Armagh preached a stimulating sermon.

NATIONAL HOSPITAL FOR THE PARALYSED AND EPILEPTIC.—A bazaar will be held in the out-patient hall of the hospital on Founders' Day, Nov. 2nd, and will be opened by Lady Beauchamp at 3 P.M. The hospital will be open to inspection.

HUNTERIAN SOCIETY.—The new session of the Hunterian Society will open on Wednesday, Oct. 26th, at 9 P.M., when Prof. E. H. Starling, F.R.S., will deliver the first Hunterian Society Lecture on "Some Heart Problems." The lecture will be delivered at the Sion College, Embankment, London, E.C. All members of the medical profession are cordially invited to be present.

SELBORNE SOCIETY.—A dinner will be held on Oct. 25th at the Hotel Cecil. Viscount Grey, of Fallodon, Vice-president of the society, will take the chair and will speak about the scope of the Gilbert White Memorial scheme. Tickets (at 15s.) may be obtained from the Hon. Secretary and Treasurer, at The Hermitage, Hanwell, London, W. 7.

FEDERATION OF MEDICAL AND ALLIED SOCIETIES. The regular meeting of the Medical Council will be held at 12, Stratford-place, Oxford-street, London, W., on Tuesday, Oct. 25th, at 5 P.M. The agenda includes the preparation of evidence to be submitted at the panel inquiry; the consideration of the subject of control of conception in wedlock, whether knowledge on the matter should be promulgated, and, if so, what knowledge and by whom; any other business.

BRISTOL MEDICO-CHIRURGICAL SOCIETY. — The forty-ninth session of this society was opened on Oct. 12th, the new President, Mr. Cyril H. Walker, delivering an inaugural address on Quackery in the Treatment of Ophthalmic Disease. He traced the course of irregular practice in this field of medicine from the earliest times until now, concluding with a plea for greater attention to eye diseases, and better facilities for their treatment by the family practitioner. The secretary, Mr. Stuart V. Stock, was able to forecast an interesting programme for the coming session.

KING'S COLLEGE HOSPITAL LISTERIAN SOCIETY.—The inaugural address was delivered on Oct. 19th by Dr. Arthur Whitfield on the Gentle Art of Making Mistakes. On Nov. 2nd Mr. P. B. Atkinson will speak on Graves's Disease. The meeting on Nov. 16th will be devoted to a debate. On Nov. 30th Miss C. P. Francis will speak on English Medicine in the Middle Ages, and Dec. 14th will be a clinical evening. On Jan. 18th Dr. J. E. Hadfield will lecture on Psychotherapy in General Practice, and on Feb. 1st Mr. C. P. G. Wakeley on Defects in the Mandibular Arch. Dr. C. F. T. East will give an address entitled, "Maladies, Ancient and Modern" on Feb. 15th, and Mr. B. J. B. Devine will speak on the subject of Carcinoma on March 1st. March 15th will be a clinical evening. The president for the session is Dr. F. W. Tunnicliffe. The meetings are held at 8.15 P.M. on Wednesdays at King's College Hospital.

The Services.

NAVAL MEDICAL SERVICE.

Surg. Comdr. W. Bradbury to Durban (on commg.).

ROYAL ARMY MEDICAL CORPS.

Maj. G. H. Stevenson retires, receiving a gratuity, and is granted the rank of Lt.-Col. Maj. T. Walcot, late temp. Capt., to be temp. Maj., and to relinquish the rank of Maj.

Temp. Lts. to be temp. Capts.: R. M. Walker, C. W. Bennett, and W. H. Steil.

Officers relinquishing their commns.:—Temp. Capts. T. Walcot (granted the rank of Maj.), H. N. K. Kevin, and E. L. Davey (retain the rank of Capt.), and Temp. Lt. G. L. Lyon-Smith.

TERRITORIAL ARMY.

Col. H. Burrows, T.A. Res., to be Col.

Lt.-Col. J. G. Martin, from R.A.M.C., T.A., to be Col. and A.D.M.S., West Lancs. Divn.

Lt.-Col. (Bt. Col.) C. T. Green, having attained the age limit, is retired, and is granted the rank of Col., with permission to wear the prescribed uniform.

Maj. S. F. St. J. Steadman, from Genl. List, to be Maj.

Majs. J. W. Slaughter and M. A. Archdale, having attained the age limit, are retired and retain the rank of Maj.

Maj. J. Orton, having attained the age limit, is retired, and retains the rank of Maj., with permission to wear the prescribed uniform.

Capt. G. E. Lloyd (late R.A.M.C.) to be Lt., and relinquishes the rank of Capt.

Capt. H. W. Read to be Maj.

Capts. A. E. Delgado and W. H. Kiep resign their commns. and retain the rank of Capt.

2nd W. Gen. Hosp.—Capt. P. R. Wrigley, having attained the age limit, is retired, and retains the rank of Capt.

TERRITORIAL ARMY RESERVE.

Lt.-Cols. E. H. Cox (from 3rd E. Lancs. Fd. Amb.) and C. W. Eames (T.A. Res.) to be Lt.-Cols.

Maj. H. W. Pritchard, having attained the age limit, is retired, and retains the rank of Maj., with permission to wear the prescribed uniform.

Capt. G. G. Johnstone, from 2nd Lond. San. Co., to be Capt.

TERRITORIAL DECORATION.

The King has conferred the Territorial Decoration upon the undermentioned Officers:—

Army Medical Service.—Col. J. Clay, C.B.E. (Hon. Lt. in Army).

Royal Army Medical Corps.—Lt.-Col. C. O. Parsons, 2nd Welsh Fd. Amb., and Majs. J. H. Hobling, 2nd S. Mid. Fd. Amb., and G. B. Robinson, D.A.D.M.S., H. Counties Div.

ROYAL AIR FORCE.

Dental Branch.—Flight Lt. L. S. Kettlewell relinquishes his temporary commission on ceasing to be employed, and is permitted to retain the rank of Capt.

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SOCIETIES.

ROYAL SOCIETY OF MEDICINE, 1, Wimpole-street, W.

MEETINGS OF SECTIONS.

Monday, Oct. 24th.

SECTION OF ODONTOLOGY: at 8 P.M.
Presidential Address by Mr. Montagu Hopson.
Mr. J. B. Parfitt: The Treatment of Pulpless Teeth.

Tuesday, Oct. 25th.

SECTION OF MEDICINE: at 5.30 P.M.
Dr. W. W. Payne and Dr. E. P. Poulton: Epigastric Pain.

Thursday, Oct. 27th.

SECTION OF UROLOGY: at 2.30 P.M., at St. Bartholomew's Hospital:
Operations by Mr. Girling Ball.
At 5 P.M.:
Demonstration of Cases by Sir Thomas Horder in the wards.
At 8.30 P.M., at No. 1, Wimpole-street: *Presidential Address* by Sir Thomas Horder: The Medical Aspects of Some Urinary Diseases.

Friday, Oct. 28th.

SECTION OF STUDY OF DISEASE IN CHILDREN: at 5 P.M. (Cases at 4.30 P.M.)
Cases will be shown by:
Dr. J. Porter Parkinson: A Case for Diagnosis. Dr. E. Bellingham Smith: (1) Spleno-medullary Leukæmia; (2) Stricture of Œsophagus; (3) Syphilitic Infantilism with Splenomegaly.
Dr. Eric Pritchard and Dr. B. Whitchurch Howell: Case of Recurrent Purpura with Joint Lesions and Fractures.
Other cases will be shown.
Dr. Donald Paterson: Duodenal Ulcer in Infancy.

SECTION OF EPIDEMIOLOGY AND STATE MEDICINE: at 8 P.M.
Presentation of Jenner Medal to Sir Shirley Murphy by the President of the Section.
Dr. L. G. Haydon: Plague in Wild Rodents in South Africa.

MEDICAL SOCIETY OF LONDON, 11, Chandos-street, Cavendish-square, W.
MONDAY, Oct. 24th.—8.30 P.M., Discussion on The Modern Treatment of Diabetes (introduced by Sir Archibald Garrod), followed by Sir William Willcox, Dr. O. Leyton, Dr. W. Langdon Brown, Dr. Edmund Spriggs, Dr. E. P. Poulton, Dr. George Graham, and Dr. P. J. Cammidge.

HUNTERIAN SOCIETY, at Sion College, Embankment, E.C.
WEDNESDAY, Oct. 26th.—9 P.M., First Hunterian Lecture:—Prof. E. H. Starling, F.R.S.: Some Heart Problems.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

ROYAL COLLEGE OF SURGEONS OF ENGLAND, Lincoln's Inn Fields, W.C.
Museum Demonstrations in the Theatre of the College for Advanced Students and Medical Practitioners:—
MONDAY, Oct. 24th.—5 P.M., Prof. S. G. Shattock: Papilloma and Adenoma.
FRIDAY.—5 P.M., Sir Arthur Keith: Effects following Disordered Action of Thyroid (illustrated by lantern slides).

WEST LONDON POST-GRADUATE COLLEGE, West London Hospital, Hammersmith, W.
MONDAY, Oct. 24th.—12.15 P.M., Dr. Burnford: Pathological Demonstration. 2 P.M., Dr. S. Pinchin: Medical Out-patients. Dr. Morton: X Ray Department. 2.30 P.M., Mr. Addison: Visit to Surgical Wards. 5 P.M., Dr. A. Saunders: Lecture:—Gastric and Duodenal Ulcer.
TUESDAY.—10 A.M., Mr. Steadman: Dental Department. 11 A.M., Dr. McDougal: Electrical Department. 12 noon, Mr. Sinclair: Surgical Treatment of Gastric and Duodenal Ulcer. 2 P.M., Mr. Tyrrell Gray: Demonstration of Cases in Surgical Wards. Mr. Banks Davis: Diseases of the Throat, Nose and Ear. 5 P.M., Dr. Cole: Lecture:—The Treatment of Early Mental Disorder.
WEDNESDAY.—10 A.M., Mr. MacDonald: Genito-Urinary Department. 2 P.M., Dr. Burnford: Demonstration of Cases in Medical Wards. Mr. D. Armour: Visit to Surgical Wards. Mr. Tyrrell Gray: Operations. Mr. Gibb: Eye Department. 5 P.M., Dr. Burnford: Lecture:—B. Coli Infections.
THURSDAY.—11 A.M., Dr. Simson: Gynæcological Demonstration. 2 P.M., Mr. MacDonald: Surgical Out-patients. Mr. D. Armour: Operations. Mr. Simmonds: Orthopædic Department. 5 P.M., Dr. Snowden: Lecture:—Simple Methods of Psychological Treatment.
FRIDAY.—2 P.M., Dr. Burrell: Medical Out-patients. Mr. Sinclair: Surgical Out-patients. Dr. Pernet: Skin Department. 2.15 P.M., Mr. Addison: Operations. 2.30 P.M., Dr. Pritchard: Demonstration of Cases in Medical Wards. 5 P.M., Dr. Cole: Insanity and Heredity.
SATURDAY.—10 A.M., Dr. A. Saunders: Medical Diseases of Children. Dr. Burnford: Visit to Medical Wards. 2 P.M., Dr. Owen: Medical Out-patients. Mr. Simmonds: Surgical Out-patients.
Daily:—10 A.M., Visit of Post-Graduates to Wards. 2 P.M., In-patient, Out-patient Clinics and Operations.

NATIONAL HOSPITAL FOR DISEASES OF THE HEART POST-GRADUATE COURSE, Westmoreland-street, Marylebone, W.
MONDAY, Oct. 24th.—11 A.M., Dr. Goodall: Out-patients. 2 P.M., Dr. Moon: In-patients. 5.30 P.M., Lecture:—Dr. P. Hamill: Diseases of the Myocardium.
TUESDAY.—10 A.M., Dr. Parsons-Smith: Out-patients. 11 A.M., Dr. Price: In-patients. 2 P.M., Sir S. Russell-Wells: Out-patients.
WEDNESDAY.—10 A.M., Dr. Parkinson, 2 P.M., Dr. Moon Out-patients.
THURSDAY.—2 P.M., Dr. Price: Out-patients. Dr. Moon: In-patients. 6.30 P.M., Dr. Hamill: Out-patients.
FRIDAY.—10 A.M., Dr. Parsons-Smith: Out-patients. 2 P.M., Dr. Parkinson: Out-patients. 3 P.M., Dr. Parkinson: In-patients. 4 P.M., Dr. Goodall: In-patients.
SATURDAY.—10.30 A.M., Dr. Hamill: In-patients.

HOSPITAL FOR SICK CHILDREN, Great Ormond-street, W.C.
THURSDAY, Oct. 27th.—4 P.M., Lecture:—Dr. Theodore Thompson: Some Functional Disorders of Childhood.

ST. MARYLEBONE GENERAL DISPENSARY, 77, Welbeck-street, Cavendish-square, W.
Post-Graduate Course on Infant and Child Welfare.
A Course of Twelve Lectures on the Management and Feeding of Infants and Young Children, by Dr. E. Pritchard, to Qualified Practitioners.
WEDNESDAY, Oct. 26th.—6 P.M., Lecture VII.:—The Management of Difficult Cases.
FRIDAY.—6 P.M., Lecture VIII.:—Treatment of Minor Ailments.

ST. JOHN'S HOSPITAL FOR DISEASES OF THE SKIN. 49, Leicester-square, W.C.
THURSDAY, Oct. 27th.—6 P.M., Chesterfield Lecture:—Dr. W. K. Sibley: Electrical Treatments, X Rays.

MANCHESTER ROYAL INFIRMARY POST-GRADUATE CLINIC.
TUESDAY, Oct 25th.—4.30 P.M., Dr. D. E. Core: Differential Diagnosis of Disseminated Sclerosis.

ST. MARY'S HOSPITALS POST-GRADUATE LECTURES, Whitworth-street, West Branch, Manchester.
FRIDAY, Oct. 28th.—4.30 P.M., Dr. Donald: Lacerations of the Genital Tract.

MANCHESTER FRENCH HOSPITAL POST-GRADUATE LECTURES, 24, Acomb-street, Whitworth Park.
THURSDAY, Oct. 27th.—4.15 P.M., Dr. A. C. Magian: Dysmenorrhœa.

UNIVERSITY OF SHEFFIELD.—FACULTY OF MEDICINE.
Post-Graduate Lectures and Demonstrations.
TUESDAY, Oct. 25th. (At the Royal Infirmary.)—3.30 P.M., Mr. A. Cuff: Acute Abdomen. 4.15 P.M., Dr. A. G. Yates: Demonstration of Cases of Intracranial Syphilis.
FRIDAY. (At the Royal Hospital.)—3.30 P.M., Dr. E. F. Skinner: Dermatological Cases. 4.15 P.M., Mr. G. S. Simpson: Demonstration of Cases.

ROYAL INSTITUTE OF PUBLIC HEALTH, 37, Russell-square, W.
A Course of Eight Lectures and Discussions on Problems of Public Health in Relation to Industrial Hygiene at the Lecture Theatre of the Institute.
WEDNESDAY, Oct. 26th.—4 P.M., Lecture II.:—Dr. R. M. Wilson: The Political Significance of Industrial Hygiene.

Appointments.

EASTWOOD, E. H., M.B., Ch.B.Liverp., has been appointed Demonstrator in Pathology and Bacteriology in the University of Sheffield.
PATRICK, J., M.B.Glasg., F.R.C.S.Edin., F.R.F.P.S.Glasg., a Lecturer in Clinical Surgery at the Royal Infirmary, Glasgow.
WARD, J. O., M.R.C.S., L.S.A., Certifying Surgeon under the Factory and Workshop Acts for Knottingley.

Vacancies.

For further information refer to the advertisement columns.
Aberdeen University and North of Scotland College of Agriculture.—Physiologist. £600.
Aberystwyth Infirmary and Cardiganshire General Hospital.—Res. H.S. £250.
Albert Dock Hospital, Connaught-road, E.—Surg.
Barrow-in-Furness, North Lonsdale Hospital.—H.S. £225.
Bedford County Hospital.—Asst. H.S. £150.
Birmingham General Hospital.—Two H.S.'s. £100.
Brighton, Royal Sussex County Hospital.—H.S. Cas. H.S. and Anæsth. Each £140.

Bristol Royal Hospital for Sick Children and Women.—Out-patient Physician.
Bristol Royal Infirmary.—H.S. £120.
Bury Infirmary.—Junior H.S. £150.
Cairo, Egyptian Government School of Medicine.—Prof. of Pathology. L.E.1200–1440.
Cardiff, King Edward VII. Hospital.—Hon. Asst. S.
Chester Royal Infirmary.—Asst. H.S. £150.
City of London Hospital for Diseases of the Chest, Victoria Park, E.—H.P. £125.
East London Hospital for Children and Dispensary for Women, Shadwell, E.—S. Asst. S. Asst. P.
Elizabeth Garrett Anderson Hospital, Euston-road.—Female Anæsth.
Gloucester, Gloucestershire Royal Infirmary and Eye Institution.—Asst. H.S. £150.
Great Northern Central Hospital, Holloway-road, N.—Two S.'s.
Hospital for Sick Children, Great Ormond-street, W.C.—H.S.'s. £50.
Huddersfield Royal Infirmary.—Jun. H.S. £200.
Hull Royal Infirmary.—Hon. Pathologist.
Kensington, Marloes-road Infirmary.—Fourth Asst. M.O. £200. Visiting Phys. £100.
Leeds Public Dispensary.—Res. M.O. £200.
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London County Council.—M.O. at Pentonville-road Place of Detention. £120.
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Rochdale Infirmary and Dispensary.—Sen. H.S. £300.
Royal Chest Hospital, City-road, E.C.—Clin. Assts.
Royal Dental Hospital of London, School of Dental Surgery, Leicester Square, W.C.—Prosthetic Registrar. £800.
Royal Free Hospital, Gray's Inn-road, W.C.—Res. Asst. Cas. O. £50. Female Obst. H.S. £50.
Royal National Orthopædic Hospital, Great Portland-street, W.—Hon Ophth. S. Pathologist. Hon. S. for Ear, Nose and Throat.
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Sheffield, Jessop Hospital for Women.—Asst. H.S. £100.
Sheffield Royal Infirmary.—H.S. H.S. for Ear, Nose and Throat. Asst. Cas. O. Each £150.
Swansea County Borough.—Asst. M.O. £500.
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Warrington, Lancashire County Asylum, Winwick.—Asst. M.O. £300.

Births, Marriages, and Deaths.

BIRTHS.

BARKLEY.—On Oct. 10th, at Woodcroft, Weybridge, the wife of Dr. T. Yuille Barkley, O.B.E., of a son.
BULSTRODE.—On Oct. 9th, the wife of C. V. Bulstrode, D.S.O., M.D., of a daughter (stillborn).
CLARKE.—On Oct. 14th, at Victoria Square, Clifton, Bristol, the wife of Dr. Richard Clarke, O.B.E., of a son.
EGAN.—On Oct. 4th, at Quetta, the wife of Major W. Egan, D.S.O., R.A.M.C., of a son.
EVANS.—On Sept. 7th, at Ranikhet, United Provinces, India, the wife of Captain R. R. Evans, R.A.M.C., of a daughter.
MURDOCH.—On Oct. 12th, at West Hyde, Rickmansworth, the wife of J. Murdoch, F.R.C.S.E., of a son.
STANLEY.—On Oct. 11th, at Rue des Belles Feuilles, Paris, the wife of E. Gerald Stanley, M.S., F.R.C.S., M.D. (Paris), of a daughter (Jane Elliot).

DEATHS.

BETTERIDGE.—On Oct. 14th, 1921, at "Marystowe," 3, Priory-road, Kew, the residence of his son, Alfred Betteridge, late Secretary, West London Hospital, after a short illness.
DIXON.—On Oct. 10th, at Kirkee, Mill-road, West Worthing, William Edward Dixon, F.R.C.S. Edin., aged 75 years.
MOSLEY.—On Oct. 6th, at Shaldon, South Devon, Reginald Lawson Mosley, M.B., L.R.C.S.I., aged 64 years.
NORRIS.—On Oct. 10th, at Langley Lodge, Surbiton, Frank Baker Norris, M.A., M.D., B.C.Cantab., M.R.C.S.Eng., L.R.C.P.Lond., aged 55 years.
WROUGHTON.—On Oct. 7th, John Henry Wroughton, M.R.C.S., L.R.C.P.Lond., Basutoland Medical Service.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.

Notes, Short Comments, and Answers to Correspondents.

SANITARY AND MEDICAL ADMINISTRATION IN BURMA.

THE report on sanitary administration[1] in Burma during 1919 commences by stating that "the total area and population in Burma proper under registration remained the same as in 1918," except for a slight adjustment in the boundaries of two districts. The birth-rate was 29·89 and the death-rate 31·09 per 1000, calculated on the census population of 1911, which was 9,824,390. For 1918 these ratios had been 33·01 and 39·59; and for the preceding quinquennium, 34·70 and 28·19. The birth-rate was lower than in any of the preceding ten years, and the death-rate higher than in any of these years, except 1918, when it had been 39·59 per 1000. The bulk of the population (8,713,297) are Buddhists, among whom the mortality ratio was 30·79. For Christians it was 22·59, and for Hindus 36·08. Cholera prevailed throughout the province, causing 13,260 deaths, which gives a mortality ratio of 1·35, contrasted with 0·56 for the preceding quinquennium. Pakokku, in Upper Burma, with 1296 deaths (8·16 per 1000), and Akyab, in Lower Burma, with 2270 deaths (4·30 per 1000), suffered most, but not a single district was free from this disease. Very hot weather, a late monsoon, and consequent scanty water-supply, played an important part in the spread of infection. Lieut.-Col. C. E. Williams, I.M.S., Sanitary Commissioner, who presents this report, alludes to the relative isolation of Tavoy and Mergui districts (with the comparatively low death-rates of 0·55 and 0·30 per 1000 for this disease), and of Sandoway (0·10), all in Lower Burma, as emphasising the fallacy of the theory formerly prevailing of the local origin of cholera infection, mainly depending upon soil and atmospheric conditions. These are obviously only secondary factors, though local conditions have a determining influence upon the spread of introduced infection. The outbreak of 1919 was more serious than in the years immediately preceding, and it is not reassuring to learn that "little headway has been made in most places in organising effective preventive measures. The provision of a protected water-supply has had a most beneficial effect in several towns. . . . The greater number of towns still await the provision of this important preventive work. . . . The organisation of effective preventive measures in rural areas is at present almost a hopeless task, in the face of the general ignorance and insanitary habits of the mass of the people, and of the absence of a rural medical and sanitary staff." Proposals have, however, been put forward on an unambitious scale for the organisation of preventive measures. Small-pox caused 3917 deaths (0·40 per 1000, compared with 0·05 in the preceding quinquennium); it was more prevalent in Upper than in Lower Burma, the respective mortality ratios being 0·67 and 0·20 per 1000. This was contrary to the usual course of events, the infection being almost always introduced through Rangoon. It is disquieting to learn that the case-mortality amongst vaccinated children was 78·12 per cent. at ages 1 to 5, and 55·14 per cent. at ages 5 to 10. Some doubt is thrown on the correctness of the returns. Compulsory re-vaccination at 14 years, if not earlier, and compulsory vaccination and re-vaccination of all immigrants to Rangoon by sea, is recommended. Plague caused 4397 deaths (0·45 per 1000, compared with 0·72 in the quinquennium). Rangoon, with 782 deaths (2·67 per 1000), and Mandalay, with 571 deaths (4·12 per 1000), suffered heavily, but the highest relative mortality (19·45) occurred at Minbu (in Upper Burma), closely followed by Thonzè (in Lower Burma), with 18·95 per 1000. Anti-plague inoculation and rat destruction are carried out. The increase in death-rate from fevers (12·22 compared with 10·34 per 1000 in preceding quinquennium) is explained by the presence of influenza rather than malaria. An interesting account is given of the suppression of an influenza outbreak in the Turkish prisoners' camp in November and December, 1919, at Meiktila (Upper Burma), by Col. A. H. Safford and Major T. G. Cheyne, R.A.M.C.

"The fall in daily admissions had commenced after four days of nasal and pharyngeal irrigation, and six days before inoculation was commenced—thus rendering the influence of the latter prophylactic measure uncertain: an outstanding feature of the case is the nearly absolute restriction of the field of infection to the occupants of the east section of the camp, although separated from the adjoining section only by a single line of open barbed wire fencing. This . . . points to the smallness of the radius through which air-borne infection of the disease can be carried."

[1] Rangoon: Superintendent of Government Printing, 1921.

The total number of prisoners of war (average strength for two months, November and December) was 6390. Of these 2300 were in the East Camp, among whom there were 501 cases and 32 deaths. Only four or five cases occurred among the remainder (4090) in the adjacent camp to the West. The treatment consisted in gargling, nasal douching, and inoculation. Progress is being made as regards sanitation in various directions, and it is stated that the aerobic filter latrine continues to increase in official and public estimation. It has been shown to be well adapted for places with a heavy rainfall (over 200 inches), such as Moulmein and Akyab, and is considered to require the minimum of labour on the part of the conservancy staff to maintain it in a wholesome condition.

From the report on *Vaccination* for the triennial period, 1917–18 to 1919–20, it appears that the number of persons vaccinated increased from 491,274 in the first year to 838,237 in the third, and that the ratio of successful operations rose from 34·56 to 51·85 per 1000 of the population. The deaths from small-pox decreased from 0·24 to 0·05. The percentages of success in primary operations were 95·88, 97·83, and 97·53 in the three years respectively. Lieut.-Col. J. Entrican, I.M.S., officiating superintendent-general of vaccination, considers this to be on the whole a very fair result. Experiments were made to test the duration of vitality in the lymph under the ordinary conditions to which it is subjected. This was found to be three weeks, except in March, April, and May, when a fortnight, or even less, was the limit. No vaccination should be done during the hot weather months, unless the lymph can be used within 10 or 12 days of its issue (except in presence of a small-pox epidemic). The lymph used is always glycerinated. After many experiments a good method of closing the tubes without heat was evolved. The ends are plugged with a mixture of plaster-of-Paris, and a very concentrated solution of gum acacia, and afterwards dipped in a resinous mixture, impervious to air and moisture. After experimenting on various preservatives it was found that "glycerine still holds the field against all comers."

During the triennium 1917–19 the post of Inspector-General of Hospitals was held by Col. P. C. H. Strickland, I.M.S., who was succeeded by Lieut.-Col. Entrican in December, 1919, this latter officer presenting the report on *Hospitals and Dispensaries*. This refers to the three-year period, but contains the statistics of 1919 only, those for 1917 and 1918 having been already published. At the beginning of 1917 there were 282 hospitals and dispensaries of all kinds working in the province, and at the end of 1919 there were 269; 34 institutions had been closed and 21 opened during the triennium. Progress in hospital construction has been interfered with owing to war conditions, but there has been improvement in various ways, brick and tiled buildings taking the place of wood and matting, &c. A cheap and simple form, used in Ceylon, is recommended. It consists of a framework of iron on a concrete plinth, with single brick walls of four or five feet height, and a tiled or shingled roof. This does not meet the side walls, but is low enough to prevent rain beating in. The floor is cemented and cambered or curved, with openings in the side walls, so that it can be rapidly flushed and cleaned. The type seems to be well adapted for a climate such as that of Burma, where there is no cold weather. Instruments and appliances are somewhat out of date in many hospitals, and Col. Entrican suggests that it would be an excellent thing if some of the medical and surgical equipment available in England, after demobilisation of war hospitals, could be procured to improve the equipment of Indian hospitals. He mentions good modern splints, and a Harcourt chloroform inhaler as especial desiderata.

The total number of patients treated in the three years under consideration at the public hospitals and dispensaries amounted to 6,256,943, being an increase of 197,519 over the preceding triennium. Of this total 285,363 were indoor patients, the beds available at the end of 1919 being 6452, compared with 6324 at the end of 1916. The percentage of the total population of Burma treated was 17·37 in 1917, and 16·89 in 1919. Unfortunately all travelling dispensaries had to be closed down except one. Col. Entrican considers that a well-staffed and equipped central hospital at headquarters, with a travelling dispensary and motor ambulance transport for each township, would be a sounder method than the multiplication of small hospitals and dispensaries. There is need for segregation hospitals for infectious disease throughout the whole province, but it is considered that all infectious diseases, except small-pox, could be safely treated in segregation wards in the compound of a general hospital, provided plenty of room were available.

There are indications that leprosy is much more widespread than is generally believed, especially in Rangoon, among the Chinese community. It is stated "that the Lepers Act is a dead-letter in most municipalities. . . . A large number of pauper lepers wander about the country from one small bazar to another, and at present it is impossible to stop them." There was considerable overcrowding at the Rangoon General Hospital, the in-patients admitted having numbered 8786 in 1919, and the daily average in hospital, 472; while the number of beds was nominally only 443. This has been due partly to admission of chronic and incurable cases, which should be treated elsewhere. The largest number of admissions to hospital throughout the province, in 1919, was for injuries (15,313), and after this for malaria (12,026), not, however, of a severe type, as the percentage of mortality was only 2·95, and for the three years averaged 2·68. It is stated also that a large number of cases at present called malaria are wrongly so diagnosed. Cholera caused 1275 admissions, with a death-rate of 51·29 per cent. during the triennium. It is thought that this heavy death-rate may be considerably reduced by the adoption of Sir Leonard Rogers's method of treatment. At Myaungmya nine recoveries were reported out of ten cases so treated. There were 1553 admissions for small-pox, with 380 deaths in 1919, a large increase over the two preceding years; 1122 of the cases (with 289 deaths) occurred at Rangoon; as to this it is stated that the majority were either imported or arose from contact with imported cases. Among the unvaccinated the death-rate was 36 per cent., among the vaccinated (including all doubtful cases, when the patient was said to have been vaccinated, even if no marks were found) it was 15 per cent. The Pasteur Institute shows a steady increase of patients; of 1154 persons treated in the three years, only four (0·35 per cent.) died.

The report on *Lunatic Asylums* (1921) refers to the triennial period 1918–20. The Rangoon asylum accommodates 632 patients, and that at Minbu, in Upper Burma, 136. The latter is a converted jail, and the floor space per head is only 36 square feet. Another asylum, at Kokine, is expected to be ready for occupation during the present year. The average number of inmates in the two institutions rose from 816 in 1918 to 856 in 1920. The death-rates in the Rangoon asylum, calculated on the daily average strength, were 8·84, 10·77, and 7·57, in the three years, 1918–19–20, respectively, the chief causes being tuberculosis, pneumonia, and dysentery.

The daily average number of prisoners in the various *Jails* in Burma was 13,388 in 1919, and 14,607 in 1920, these figures being lower than in any previous year since 1910, except 1918, when the average number was 14,068. The admissions to hospital, the daily sick, and the deaths were 344·41, 19·64, and 28·53 per 1000 in 1919; and in 1920, 437·12, 21·50, and 19·92. The increase in admissions for 1920 was chiefly due to influenza. Cholera was present in Burma during 1919, but only three jails were affected, that at Myingyan having 53 cases and 31 deaths. Dysentery was unduly prevalent, with 31·49 per 1000 admissions and 3·89 deaths in 1919, and corresponding ratios of 35·03 and 3·24 in 1920. "Bowel disease" was prevalent throughout Burma in 1919, and Major H. H. G. Knapp, I.M.S., the Inspector-General of Prisons, notes that in many places there was a great plague of flies, which he considers to have had a causal connexion. Special pains were taken to tackle these vectors; and at Mandalay, from June to December, well over a million were killed by prisoners. They could not have been better employed. There was some increase of enteric fever in 1920 (39 cases and 15 deaths). Fifteen cases occurred at Insein, but the source of infection could not be traced. Ankylostomiasis was considerably more prevalent in 1920 than in the previous year, 896 cases and 9 deaths, as compared with 741 cases and 12 deaths. Search for ova and worms, and treatment of the infected were carried out more rigorously. At Akyab the infection rate was found to be 46·65 per cent., and at Prome 30 per cent.

THE AFRICAN NATIVE AND MEDICAL SERVICE.

UNDER the title "The African Native Medical Corps in the East African Campaign"[1] Major G. J. Keane, of the Uganda Medical Service, and Captain D. G. Tomblings have compiled an interesting account of the work performed by a corps recruited from one of the most intelligent and highly developed of African peoples. On the outbreak of hostilities sanction was obtained for the engagement of 40 natives as the Uganda Stretcher Bearer Company—the germ of the corps which later numbered 10 British R.A.M.C. officers and other ranks, and 1500 natives. At first the Uganda administration furnished men largely of the peasant class, who proved unsatisfactory; they were replaced by a number of volunteers—boys from the Mengo High School (Church Missionary Society), and from the Government centre at Kampala, where, prior to the war, general medical training was carried on, with particular regard to anti-venereal measures. These men soon became efficient in elementary first-aid, nursing, and stretcher drill.

[1] London: Printed by Richard Clay and Sons.

Racial Difficulties.

With the arrival of the Indian Expeditionary Force difficulties arose, for the Medical G.H.Q. of the I.E.F., which assumed control of the East African Force, based its attitude towards the African native on a knowledge of East African stretcher-bearers, recruited from the porter class and very inferior to the personnel of the Uganda unit. After representations had been made by the Governor of the Uganda Protectorate the status of "troops" as opposed to that of "followers" was conferred upon what now became the Uganda Native Medical Corps. When this status was authorised it was by no means easy to secure its recognition by Europeans; many whites who had come to the country for the first time were disposed to regard all natives as of one class; complaints were made, and the final result was the establishment of a much larger corps energetically recruited from the missionary societies' secondary school pupils. Prince Joseph Musanje, a cousin of the Kabaka (King) of Buganda, was gazetted to the corps and the latter was drafted to Dar es Salaam in July, 1917. The distribution of the corps throughout the East African Force had a considerable effect on the hospital services. The expanded organisation contained representatives of nearly all tribes of British and of the then German East Africa; the total number of natives dealt with was about 1700, and the total deaths numbered 113, of whom one was killed in action and one died in the enemy's hands.

Characteristics of the Muganda.[2]

Sir Robert Coryndon, Governor of the Uganda Protectorate, has contributed to Major Keane's account a foreword testifying to the excellent work performed by the corps. A note on the form of training adopted is added by Major H. B. Owen, and extracts from Captain Tomblings' Diary of the Corps, with two appendices, complete the record. Major Keane himself refers in this way to the individual tribesman of his command: "The Muganda has a curious notion of what is manly, especially in regard to menial work, all forms of which he instinctively looks down on as degrading; hence considerable difficulty was experienced in inculcating the fact that all service to the sick, no matter how menial, was of a high order. His intense and fanatical pride of race renders him acutely sensitive to scorn, and apt to imagine insult where none is intended. With tactful and sympathetic handling there are few ordinary services which a Muganda will not perform in a manner that compels admiration. Of precocious intelligence, he can be a willing, cheerful, trustworthy, and industrious assistant. Unsympathetically handled he may be slothful, obstinate, sulky, or even mutinous, and utterly regardless of personal consequences."

"*African Medical Education.*"

Relevant to this subject is an article entitled "African Medical Education," contributed to the October issue of *Mercy and Truth* (the record of the medical missions of the Church Missionary Society), by Dr. R. Y. Stones, who, during the last months of the war, served with the African Native Medical Corps, to which he brought experience in training West African Ibos in Nigeria, and Swahili and Wagongo in the Tanganyika Territory. Dr. Stones is convinced "that the average African makes a good dresser and war attendant, that he is able to learn simple dispensing, can give anæsthetics skilfully, and do routine microscopical work." By the title of his article, however, Dr. Stones does not refer to the training of Africans as medical men, but to the ability of the natives to acquire a certain amount of medical knowledge and thereby overcome the superstition and error in treatment of disease which at present exists among them.

MILK—AND WATER.

SOME 10 or 12 years ago the West Sussex County Council threatened to institute no further proceedings under the provisions of the Food and Drugs Act for the reason that the justices, even in glaring cases of violation of the Act, imposed only small penalties. Nowadays this offence is taken more seriously. On Oct. 10th a Steyning farmer was summoned for selling milk which was not of the nature and quality demanded by the purchaser. An inspector, on August 30th, stopped at the farm gate a lorry laden with milk for Southwick. Samples were taken, and that sent to the analyst showed there was only 3·63 per cent. of fat, 5·42 per cent. of non-fatty solids, and 36·2 per cent. of added water. Two days later the inspector paid a surprise visit to the farm and took samples of the milk actually drawn from the cows. One of these samples showed 5·85 per cent. of fat, 8·93 of non-fatty solids, and no added water. The farmer could offer no satisfactory explanation and was fined £20.

[2] A note on the words Muganda, Buganda, &c., appeared in THE LANCET of Sept. 3rd, 1921, p. 540.

A DISAPPOINTED HOSPITAL.

AN announcement has appeared in the press which gives the impression that the bulk of the estate of the late Miss Annette Beaumont, of gross value £7626, is under the will of the deceased to accrue to the Chelsea Hospital for Women. This, unfortunately, is not the case. The amount is absorbed by debts, funeral, and other expenses, and not one penny will reach the hospital. It was hoped that the bequest might be available towards reducing the debt at present owed to the bankers.

THE USES OF DOG.

To the Editor of THE LANCET.

SIR,—With reference to your note in THE LANCET of Oct. 8th, in which it is suggested that it would be interesting to trace the origin of the therapeutic uses of dog, may I point out that the uses of dog were not unknown in ancient Arabian medicine? In the FitzPatrick lecture last year Prof. E. G. Browne mentioned a work by the Qádí Abu 'Alí at-Tanúkhí, who died A.D. 994, in which the following case is reported: An unnamed physician treated a boy, who was in great pain, with broth made from the flesh of a fat puppy. This was followed by melon, and later beer and hot water. On informing the patient as to the nature of the broth he was violently sick, with the result that he brought up a cattle-tick, which had evidently been swallowed with fruit! The tick, no doubt, having attached itself to the stomach, was the cause of the pain.

I am, Sir, yours faithfully,

Basle, Switzerland, Oct. 13th, 1921. T. F. M. SMART.

CHILD WELFARE IN FINLAND.

IN October, 1920, a league for the welfare of the children of Finland was founded on the initiative of General Mannerheim, having for its expressed aim the promotion and encouragement of voluntary effort in the sphere of child welfare, and the healthy development of the coming race. The constitution of the league admits of private and collective membership, the latter consisting of already existing local or national societies working in some special line of child welfare, or of local sections of the league, of which there are already 30. Private members are either active workers or contributors; the roll of membership already includes over 12,000 names. It is proposed in time to include in the activities of the league all the various branches of child welfare, but the Executive Council has decided, at the outset, to restrict its work to rigorously defined lines of action, and calls for immediate development on hygienic, moral, and educational lines, of infant welfare, and of the training of older children from the ages of 11 to 18. A substantial grant has been received from the National Exchequer for the organisation of courses for qualified nurses and midwives and others interested in maternity and child welfare; the continuance of the grant is dependent upon the success and continuance of this work. The league already has in operation a travelling bureau of information, and it is intended to establish a central consultative library in Helsingfors.

BRITISH SPAS AND FOREIGN COMPETITION.

AT the recent half-yearly meeting of the British Spa Federation held at Droitwich a leading topic of discussion was the Sunday closing of the baths now customary at Droitwich and other resorts, and its bearing on the whole question of foreign competition. In Droitwich spa authorities had been attacked on the score that the numbers of week-end visitors had diminished owing to the Sunday closing, and their action in that respect was defended by several speakers. It was contended that no hardship had been entailed on any one, that serious spa treatment demanded at least a two or three weeks' stay, that the rest-days frequently prescribed during treatment might well be arranged to fall on Sunday, that a whole day's rest was desirable for the staff of the establishment, and that in any case the expense of Sunday opening was prohibitive. At the same time it was acknowledged that English spas had much to do to compete with the foreign resorts, many of which were subsidised by their respective States, particularly—according to some speakers—in the matter of coöperation between spa managers, hotel proprietors, and members of the medical profession. From various speeches it was to be gathered that the meeting was generally in favour of Sunday closing of baths, and representatives of those resorts where they remain open had no encouragement to offer on that head. But it seems very doubtful if such an attitude will serve the British spas at a time when the Continental watering-places are striving their hardest to recapture their pre-war English visitors.

Erratum.—THE LANCET, Oct. 15th, 1921, p. 799. The Accuracy of the Formalin and Sachs-Georgi Tests for Syphilis. For W. Neave Kingsbury read *A.* Neave Kingsbury.